THE

WEALTH OF INDIA.

A Monthly Magazine of Practical Information and Useful Discussions

EDITED BY MR. G. A. VAIDYARAMAN, B.A.

Vol. II.] DECEMBER 1913. [No. 12

The Wealth of India.

The object of this Monthly is to publish the views of experts on the various problems bearing on material progress, specially agriculture, commerce, industry, economics, co-operation, banking, insurance, popular, scientific and technical education, to digest the notable articles appearing in the leading magazines and periodicals and generally to serve as a record of practical information, and useful discussions. It is believed such a publication is indispensab'e to statesmen, publicists, businessmen, students of economics and all others interested in the material and moral advancement of the country.

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	Inland.	Foreign.
	Rs. A. P.	s. d.
Per annum	5 0 0	12 0
Single copy	0 8 0	1 0
Sample copy	0 2 0	1 0

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Current Topics

BY ECONOMICUS.

A Financial Genius.

The financial atmosphere on the side of the Punjab and Bombay seems now to have cleared up. The banking and commercial failures will indeed leave their traces behind which it will take a long time to obliterate and the echoes of the recent crisis will continue to be heard now and again. But the money market has resumed its normal aspect and things are following their usual course. One bright star which shed its brilliant lustre in the financial firmament for the last few years will be sadly missed and the late Mr. Chunilal D. Saraiya, Managing Director of the now defunct Indian Specie Bank, will be long remembered as one of the most daring, skilled and resourceful financiers India has ever produced. Mr. Saraiya loomed large in the public eye while the crisis in the Bombay Share Bazaar was at its height owing to his intimate connection with the speculation in mill shares and the High Court's inquiry into the affairs of the Credit and Specie Banks. The exposures in the case of the Credit Bank made the public mind suspicious and one of the shareholders of Mr. Saraiya's Bank petitioned the High Court to order the winding up of the concern. Allegations of a most damaging character were made in the petition against the Managing Director and his conduct of the affairs of the Bank and a plausible case was made out in favour of the liquidation of the concern. From such evidence as had come

before it, the Court felt convinced that the matter was grave enough to require an immediate scrutiny. But such was the implicit confidence reposed in Mr. Chunilal's genius and capacity by the public that big shareholders came forward to oppose the petition for the winding up of the Bank. The solitary petitioner found no one to back him up and his petition was rejected by the Court. It was a day of rejoicing and of signal triumph for Mr. Saraiya. He was smothered with congratulations and laudations. The Indian Specie Bank was the largest Indian-managed bank and its transactions ran into several crores of rupees. The life and the soul of the concern was Mr. Chunilal who had, by mere dint of resourcefulness and by the immeasurable influence he wielded in the money market piloted the Bank through the storm of the financial panic. The Bank had already paid out lakhs upon lakhs to its depositors and now that the confidence of the public had been restored, it was believed the concern had passed out of the danger zone. It was, however, only a lull before the storm and just a few days after Mr. Saraiya had come out unscathed from the ordeal, the public was dumb-founded on a fine Saturday morning to learn that the financial genius had passed away. He died from a natural cause,—heart failure, a complaint of old standing with him. But the end had come with such dramatic suddenness that suspicions were roused and various rumours were soon afloat. They were, however, soon set at rest and everybody, friend and foe alike, deeply mourned the tragic termination of a brilliant career. Within a few hours of the death of Mr. Saraiya, the Directors of the Bank applied to the High Court for orders to wind up the concern. This one fact was sufficient to establish the deceased gentleman's prestige, reputation and influence in the world of finance. It was generally believed that, notwithstanding the statement of the Directors about the position of the Bank, its speculations and enormous losses, if Mr. Saraiya had lived, he would have successfully carried on the affairs of the concern. Whatever that may be, it soon came out that in its silver speculations which had been stoutly denied, the Bank had sustained enormous loss and that more than one crore and fourteen thousand rupees had been wiped off by the losses all taken together. Yet the assets of the Bank were considerable and it is supposed even now that the depositors are nearly safe. The name of Mr. Chunilal has become widely known on account of his corner in silver. Some years ago he formed a powerful syndicate which bought an enormous quantity of the white metal and held it in anticipation of a rise in price When the Government of India came into the silver market as expected, a large portion of the stocks was disposed off. Yet a quantity remained on the hands of the syndicate and contributed to the loss of the Specie Bank which had advanced part of the money.. The 'Silver King' had thus attained a position in the financial world such as no Indian had before approached. Indeed Mr. Saraiya's was a most remarkable personality. Finding the medical profession uncongenial to his genius, Mr Chunilal took to banking business, and soon made his mark there. But even there he soon found his ambition thwarted. He decided to demonstrate to the world that given the necessary opportunities, Indians were quite capable of managing large financial concerns and that they need not, as a rule, be relegated to subordinate positions. It was under these circumstances that the Indian Specie Bank came to be started and within its brief existence of seven years, the concern rose to a position of great importance. Its branches were widely scattered throughout the Bombay Presidency and even outside it and it was perhaps the only Indian-managed bank to have a branch in London. Mr. Saraiya wanted more of his countrymen to take to banking and commerce and to see that Indians occupied the proper place in the finance and trade of their country. Whatever opinion one may form of his heavy speculations in silver, and in shares and the consequent losses entailed upon his Bank, there can be no doubt about his great ability, daring and resourcefulness His memory will be long cherished as that of

a wonderful financial genius of this generation.

Banking Revelations. It is unfortunate that the memory of the late Mr Chunilal Saraiya, to whose financial genius we have paid a warm tribute of praise above, should be sullied by charges of reckless speculation of the worst sort with the money of the depositing public and of what has been described as the 'lowest form of fraud.' Not even the bitterest enemy of the deceased gentleman has ever whispered against him an allegation of dishonest transactions carried on for private gain. On the contrary, every one has had a very high opinion of Mr. Saraiya's charming personality and unselfish character. Whatever he did is supposed to have been done absolutely in the interests of the Bank whose parent and guardian angel he was. When the most damaging criticism was being passed upon the conduct of the Indian Specie Bank and the colossal speculations of Mr. Chunilal, the admiring public believed in his integrity and managing capacity as also his power to ride the roughest of financial storms. And it is really a pity that he is not alive to reply to the damaging criticism which has been passed condemning his banking methods. It is difficult to think however whether he could have been in a position to explain satisfactorily the irregularities and the 'miserable tale of the lowest form of fraud' which have been unfolded to the naked gaze of the public by the auditors appointed by the Bombay High Court to inquire into the affairs of the Indian Specie Bank. Even the most enthusiastic admirers of the late Mr. Saraiya will admit the necessity of being plain-spoken in the present case where the interests of the public and of Swadeshi banking and industry are deeply involved. The Court was anxious from the very outset that the widest publicity should be given to the disclosures made in the course of the investigations carried on into the transactions and methods of the banks which have been stranded in the recent financial tempest in Bombay. It will undoubtedly be a great public gain if the people at large get an idea of the manner in which some banking institutions have been managed and the risks they run in trusting the banks with their money. Company promoters and Directors will also be on their guard and there are hopes of an all-round improvement in our financial organization being effected in the near future. With this conviction it is that we draw the attention of our readers to the banking methods and speculative transactions on which a search light has been thrown by the scrutiny of the auditors appointed by the High Court to report upon the condition of certain banks in Bombay. At one time it was fondly believed by the depositors of the Indian Specie Bank, in spite of the opinions expressed to the contrary, that their money was quite safe, and there was long a serious talk of the reconstruction of the concern. But in the light of the disclosures now made, this hope has been dashed to the ground. Within the short time available to them and with the material placed at their disposal, the auditors could not make a complete and satisfactory report. The colossal character of the Bank's dealings in silver will, however, be guaged from the calculation that Rs. 30 lakhs have been lost on open contracts with certain firms involving a sum of 5 crores and 10 lakhs. "The amount of the orthodox business," the auditors remark, "pales into insignificance in comparison with the mammoth silver deals." The account standing in the name of the mysterious M. Nanahboy is supposed to represent an entire loss which goes into several lakhs. Loans amounting to 64½ lakhs were made against pearls and 27¼ lakhs are securities on 'badlas' of mill shares. There will be serious loss on these transactions too. "The whole of the Reserve Fund and the capital of the company have also been wiped off and it is doubted whether the dividends were paid out of profits." With regard to accounts and audit, the report of the Auditors say:—'It is entirely disappointing to have to relate what can only be described as a miserable tale of the lowest form of fraud, the creation of fictitious debtors and the preparation of demand promissory notes in support of these.

The late Mr. Chunilal had many admirers either on account of his personality or because of the important part he played in finance and as a manager of a large Swadeshi banking institution. It is therefore the more deplorable that he failed to carry through his operations in an honorable manner. The methods adopted in falsifying the accounts cannot be described as novel." It is in this strain that the Auditors write and the account they give of the silver and other transactions is amazing. Equally astounding is the report made by the Accountants appointed to examine the position of the Pioneer Bank of Bombay when the petition to wind up the concern was presented to the High Court. We shall not here refer to the damaging criticism they have passed in detail upon the various features of the Bank's situation and conduct. It will be enough if we quote their general remarks. After showing how the capital subscribed and paid up as shown in the accounts is absolutely false and misleading, the Auditors say:—" In conclusion, it is very disappointing to find that the affairs of this Bank were not run on the lines of legitimate banking and the fewer the concerns run on the lines indicated the better for the tradition and good name of Swadeshi Banking in India. The recent exposures of some ill-managed Swadeshi concerns must have caused serious disappointment to honest promoters and advocates of Swadeshi entrprises with the result that public confidence is entirely shaken and progress retarded for another generation."

The Proposed Commercial Congress.

We do not know how far the idea, which emanated from Bombay, of an All-India Commercial Congress has advanced. Some time ago, the draft rules of this new organization were published for the information of the public, but it appears no further action has yet been taken. Everybody who knows anything about the existing Indian Industrial Conference agrees that that body has done and is doing an amount of very useful work in the face of enormous difficulties. Without detracting from its valuable services to the cause of indigenous industries, it may, however, be remarked that the constitution and procedure of the Industrial Conference leave much to be desired. The Conference is moulded on the pattern of the National Congress and there is usually in it a larger flow of oratory than the transaction of practical work. What the General Secretary of the Conference does for the industrial progress of the country in the face of so much apathy on the part of the public must be frankly recognized as highly creditable and the literature which has accumulated in its reports and publications is a veritable storehouse of information bearing upon industrial and economic questions. The Conference has also been representing to the Government the industrial needs and grievances of the people and thus voicing public opinion on matters commercial and industrial. The proposed Commercial Congress, if it enlists the support of prominent people in the various parts of the country, may perhaps perform this work more effectually and with greater success. Our idea in this connection, however, is that ventilating public grievances and representing popular opinion in an authoritative manner is only one and by no means the most important part of the business of a Commercial Congress. What we should like particularly to see is that serious attention bestowed upon the question of starting new industries, small and large, and preserving the old ones wherever possible, by men who have the leisure and the earnestness requisite for the purpose. The work of the Congress should be divided among committees and questions should be dealt with in a thoroughly practical spirit on the lines of the Agricultural Conferences like the one recently held at Coimbatore. Many Swadeshi concerns have come to grief during the last few years owing to the lack of practical knowledge and expert guidance. Such waste of capital and energy ought to be avoided. That an organization of the type proposed is a badly felt desideratum goes without saying, but we want it to be a living and working body. If it is going to be another edition of the existing Conference, the proposed

Congress may as well not be started. Commenting upon the draft rules of the Congress, *Capital* observes with surprise the deliberate, though indirect, intention disclosed in them 'to exclude European organizations, probably on the ground that the interests of the two communities are irreconcileable' though the paper doubts whether this assumption is entirely justified. The existing Industrial Conference has always sought and, to some extent, enlisted the co-operation of European commercial and industrial bodies. The proposed Congress is apparently meant to be a purely Indian organization. While the interests of Indian and European organizations are identical in certain matters, they are divergent in many others. The two often look at the same questions from quite opposite points of view. Then again, the economic salvation of India ought to be sought by Indians on the principle of self-help as far as possible. We have already separate European and Indian commercial bodies which represent entirely different interests and they have accordingly secured separate representation even on the Legislative Councils. We are not therefore surprised if European bodies are deliberately excluded in the draft rules of the Commercial Congress. There is nothing to prevent the two organizations from combining when they can stand on common ground *Capital* also notes with regret 'the decision not to confine the Congress to representatives of Chambers of Commerce, but to include in the constituency of the Congress, various Leagues, Associations and so forth, thus rendering the Congress, in many respects, merely a replica of the old Industrial Conference, in which the lawyers used to hold forth omnisciently on the need of industries.' We would ourselves wish to see the Congress confined strictly to business organizations; but there is no analogy in this respect between England and India and we cannot rigidly follow the example of great Britain where the Commercial Congress is confined to representatives of Chambers of Commerce. *Capital* is perfectly right when it remarks that 'the purpose of the limitation is to confine discussion to business matters and bring to bear on such subjects only the knowledge of men whose experience enables them to speak with first-hand authority on whatever questions may be brought before them.' It must, however, be borne in mind that in India we have very few businessmen who can speak with authority and take part in the congress outside the Presidency towns and the co-operation of zealous non-businessmen has to be sought. It is besides largely due to the latter class of men that we have had an industrial awakening in India and their contribution to India's industrial progress cannot be so lightly treated. *Capital* is hard upon the lawyers whose unwillingness to put their money into industrial ventures is sharply contrasted with their empty harangues about the need of new industries. There is some truth in what *Capital* says; but for reasons given above, we feel that the time has not yet come in India when a Commercial Congress may be confined solely to businessmen. Several lawyers in India, again, do possess business experience and it would be unwise to exclude them from commercial discussions. It is also usually this class of men who have the capital required for industries and their co-operation is absolutely essential. We hold no brief for lawyers; we want only to point out the peculiar state of things in India at the present moment. It will, however, be always necessary that in Industrial Conferences there should be more practical work and less oratory. There should be a systematic programme drawn up for the work to be done by the committees of the Congress and the main object, *viz.*, the industrial regeneration and progress of India should be consistently kept in view.

Cotton Production in India.

The provision of an adequate supply of the raw material at a sufficiently cheap price continues to be a subject of absorbing and anxious attention with cotton spinners and manufacturers in Europe. The cotton industry all the world over has been rapidly expanding and strenuous endeavours are being made by the British Cotton-growing

and other Associations to secure an increased supply of raw cotton in proportion to the growing demand. While the possibilities of Africa and Australia are being tried, wistful glances are being cast on India for the past few years. This country already produces a large quantity of cotton, though of a comparatively inferior type and its potential productive capacity is regarded as immense. Pressure is already being brought to bear upon the Secretary of State for India by deputations on behalf of European cotton spinners and manufacturers. The people and the Government of India are not unaware of the profitable character of the indigenous cotton crop and the Agricultural Departments are doing their best to encourage the cultivation of superior types of cotton. The area of cotton cultivation in this Presidency, in Bombay and elsewhere has been steadily expanding and the prospects for the cotton-growing industry in India are hopeful. The exports of raw cotton were valued in 1910-11 at more than 36 crores of rupees. This means the production of largre quantity of wealth in the country and a larger quantity available for distribution. While the advantages of the promotion and improvement of cotton cultivation are patent to everybody, no one in India would like the country to be hustled. It may be recalled that some time ago, the Secretary of State for India observed in reply to a deputation on this question that though the expansion of cotton cultivation was an object the Government of India had at heart, there were certain limitations to which the question was subject. For example, cotton cultivation in India, however immediately profitable, cannot be pursued to the detriment of the food crops. In these days of high prices we, in an agricultural country like India, must ensure an adequate supply of food grains and cannot afford to prosecute the cultivation of commercial crops at the cost of food grains. British spinners and manufacturers would like the Government of India to devote more attention and money to the expansion of the area under cotton. The latest exhortation comes from Mr. Arno Schmidt, Secretary of the International Federation of Master Cotton Spinners' and Manufacturers' Association, who read a paper on this subject before the Coimbatore Agricultural Conference discussing the possibilities of India as a cotton producing country. This is not the first time that Mr. Schmidt visits India; he has been carefully and anxiously watching the progress of cotton cultivation in this country. In the paper referred to above, he described how spinners and manufacturers in Europe were compelled to think of reducing working hours in their mills owing to the apprehension of a shortage in the American crop. The experiments now in progress in Africa have not yet borne tangible fruit and it is believed that the limit of the American crop has been reached. Not much assistance can be expected from South America and Mr. Schmidt feels that 'they were therefore bound to fall back upon India, which possessed such an excellent net work of railways, and had a hardworking population, more than 90 per cent. of whom were born agriculturists, and cotton had been an important crop in India since time immemorial.' While recognizing all the useful work which the Agricultural Departments have done in India during the past few years in connection with cotton cultivation, Mr. Schmidt is of opinion that the subject is not receiving the attention it deserves at the hands of Government. The amount spent by Government for agricultural improvement is quite paltry and a plea is put in for a larger expenditure. He then refers to Indian ginning factories which, he says, are most of them badly managed and which are to a great extent responsible for the degeneration of Indian cotton consequent upon mixing different lots of seed. He thinks that great improvement may be effected by issuing special licenses to ginning factories and by making the whole business of cotton-ginning a licensed one. Mr. Schmidt also made a very strong appeal for legislation regarding the damping of cotton by the farmer and by the ginner. There is ample evidence to show that the improvement of agriculture in India is engaging the serious attention of Government

and there is a consensus of opinion that there is no other subject worthy of more serious or immediate care than agriculture, the premier industry of this country. But men like Mr. Schmidt are interested only in the wider extension of cotton cultivation and are not likely to attach due weight to other factors which are equally important and even more so to the Government and people of India.

Progress of Indian Agriculture.

All who feel interested in the industrial and economic developement of this country will note with satisfaction the vigorous efforts that are being made by Government to promote improvement in Indian agriculture. The problem of agricultural reform in India is one of the most difficult the Government and the people have to tackle and yet agriculture is the premier industry of this country, and on it subsists the bulk of the Indian population. The directions in which the work of agricultural improvement is being conducted were shown in the proceedings of the All-India Agricultural Conference which held its sittings at Coimbatore this month. As usual, various sub-committees were appointed to discuss and report upon the different questions which came up for consideration before the Conference which passed corresponding resolutions. It is not possible for us, in this place, to notice the proceedings of the Conference at any length as they covered a vast field and had reference among others to cattle-breeding and fodder supply, the courses of instruction in Indian Agricultural Colleges and the knowledge to be imparted to the common cultivator, the use of the co-operative credit societies for the dissemination of agricultural improvements among the people and the progress made in the improvement of the indigenous sugar industry in its mechanical, agricultural and botanical aspects, the dairying industry and so forth. Sir Robert Carlyle in bringing the deliberations of the Agricultural Conference to a close briefly reviewed the progress that has been made since the Agricultural Department was started in its present form by Lord Curzon. He observed that work of great value had been done on some of the most important crops grown in India and the results of the same were becoming visible. Sir Robert remarked that the Agricultural Department had, in many places, got into close touch with the cultivator and succeeded in inducing him to look to it for guidance and help. He evinced his insight into the actual state of things when he observed that 'great as had been the advance already made, we are only at the commencement and if the progress is to be as rapid and as secure as we all desire, we must work in close touch with the co-operative movement.' Sir Robert's faith in the possibilities of the co-operative movement is large, and he thinks that though the agricultural staff in all the provinces must be strengthened, in the near future, co-operative societies ought to afford an admirable non official agency which could be guided on right lines by a comparatively small supervising staff. Referring to the idea of expanding the scope of Co-operative Societies, he uttered what we must characterize as a timely word of warning when he stated that these societies should not be used for experimental purposes and that functions allotted to them in connection with agriculture should be of a very strictly defined character. Quite remarkable progress has undoubtedly been made by the co-operative movement in India and it has immense possibilities in this country. All the same, we must be on our guard against being carried away by enthusiasm into paths which are full of pitfalls in the present condition of the mass of the Indian population. One noticeable feature of the work in connection with the improvement of agriculture is the recognition by Government of the necessity of keeping that work in intimate touch with the needs of the cultivators. This point was emphasised by Sir John Atkinson in his speech welcoming the delegates to the Conference and describing the achievements of the Agricultural Department in this Presidency. A comparison of these achievements with the results of the efforts made twenty or thirty

years ago, justified to Sir John's mind the soundness of the recommendations made by the Board of Agriculture at the meeting of Pusa in 1908 that attention should be devoted rather to investigation of cultivators' actual wants than to the recommendation of an unfamiliar and untried method and that concentration of work was of first importance. We believe that though we are only at the beginning of things and have only touched the fringe of the great problem of agrarian reform, the efforts that are being made are in the right direction and are conceived in the right spirit.

Special Articles.

INDIAN INDUSTRIALISM AND ITS LINE OF EVOLUTION.

RADHAKAMAL MUKERJEE, *Professor of Economics, Krishnath College, Berhampore.*

A study of the main features of the industrial organisation of our country reveals some striking phenomena which every one interested in our industrial development should always bear in mind. The cottage industries of our country represent a type of economic organisation which has been discredited in the west. The industrial revolution in Europe has initiated the tendency towards large scale organisation. The application of steam-power to manufacture was the main cause of this tendency, the cost of steam-installation being proportionately less the greater its size. Hence the large establishments could secure economies of production not within the reach of small establishments. Thus the cottage organisation greatly declined and became extinct in many industries, being superseded by the factory. But the decline and extinction of the cottage system was not so universal as is very often supposed. Even in countries like England and Germany, the cottage industry is still maintaining itself successfully against the large scale-organisations. In India, the cottage industry is universally regarded nowadays as a "medieval" form of industry which has become "obsolete" and the modern factory is idealised. The reason for the general dislike of the cottage industry is not far to seek. Handloom-weaving, which is by far the most important cottage industry, suddenly and rapidly declined during the last few decades in competition with the mill industry and this illustration is used to show that the extinction of the cottage system in other industries as well is inevitable. It is well known that the decline of our handloom weaving was not due solely to economic causes. The repressive commercial policy of the East India Company was an important factor in this decline. As regards the economic factor, the superior productivity of the mills in Lancashire, it should be recognised that the cotton industry in England has advantages which are by no means shared by all kinds of large industry. The employment of cheap woman labour in the cotton mills in England greatly reduced the expenses of production. Woman labour, however, cannot be employed in every kind of industry. Thus the partial absorption of handwork by machinery in the cotton industry is due to a special advantage inherent in it, and the supposition that all small industries are doomed to disappear like hand-weaving is based on a hasty generalisation.

A study of the cottage industries of the country has shown on the other hand that many of them have great vitality even under the present unfavourable circumstances. In fact the cottage industries are still living forms of economic organisation which, if certain improvements, both in the mechanical processes as well as in the general character of the business management are adopted, have a great future before them. The reasons for the persistence of such a type of organisation are obvious. It is at once the pro-

duct of our economic environment as well as our social and ethical ideals. Agriculture in all lands is always associated with small industries carried on in homes, and in our country the necessity of running small industries in cottages is easily understood, if we remember that for nearly three months in the year agriculture is almost at a stand still. Moreover, large-scale farming is unknown in our country on account of our characteristic system of land-tenure, and law of inheritance. Property being subdivided amongst a large number of family members, each person gets only a small plot of land to cultivate. Thus his family usually carries on a subsidiary industry to supplement the income obtained from agriculture. Lastly, the big industry implies certain social and economic ideals which are not acceptable to the people. The methods of western industrialism cannot be adopted without the disintegration of caste and family; but the Indian people believe in the virtues of joint family life as well as in the influence of the social ideal as embodied in caste. Indeed, they find their work repugnant when it is not also shared by other members of the family, or at least when it is not carried in their midst. The caste in their mind, represents the family writ large, and its influence on the life of the individual sanctioned and supported by religion still persists. The individual finds in the caste the expression of the ideal of a larger unity in society. First, the family and then the caste moulds the character of the individual, checking an anti-social individualism without interfering with individuality. These are still the fundamental ideas of the people of India, and it will be wrong to expect that such ideas will change very soon even amidst the forces which have now been working agains them.

Another condition which the adoption of western industrialism must presuppose is the western out-look of life. The frugal and unconventional life of the Indian presents a striking contrast with the artificial life of the Westerner. The Indian will be happy if he can satisfy his few natural wants. The Western peoples' attitude towards the satisfaction of wants is different. They believe in the multiplication of wants. Not satisfied by meeting natural needs, they create artificial, conventional needs. A higher social position in the west implies a higher grade of comfort, luxuries and conventional needs. To the Indian on the other hand, there is only one plane of living, one standard of consumption in theory. In India, comfort and not luxury is sought for, and the ideal of comfort is the same for all classes in society. The same ideal of plain living and high thinking dominates all. The respect, for man as man, and for the ideal of self-denial as the means for the realisation of God-in-man, these two striking characteristics of the Indian outlook of life, have their influence on the system of industry. India has reared a system of economic organisation on the firm basis of social equality and justice. In the Indian industrial system, no one is master, no one is servant. It is the production of wealth by free men. There is real concrete equality between man and man in the Indian economic organisation. Every one is free to pursue his economic activities in his own way. No one is forced to be idle, because no one depends for work on another. Labour is healthy and pleasant and there is sufficient leisure. The end of production in India is not wealth, but the leisure which wealth brings. And this leisure, the Indian knows to use profitably in the development of character in his intellectual and moral progress. The system of production, again, allows a large amount of leisure. In India agriculture is more important than industry and industry is carried on at intervals with agriculture. Man controls the economic machinery, the machinery does not control man Thus the labourer works cheerfully. The peasant tills the soil which his ancestors tilled before him. Their wealth he has inherited and along with the wealth he has also inherited their responsibilities, and he will bequeath his wealth with his responsibilities to his sons and grandsons. Not only the magic of property but also the duties and obligations of family life make the Indian peasant one of the most industrious workers on

the surface of the earth. Industries are carried on in cottages. In India handpower is more important than the machine. Artisans work on their own account, and not at the bidding of any masters or employees or owners of machinery; and there has been developed a system of industrial credit and trade, according to which the middlemen and traders regularly come to the artisan's cottages with ready money or with raw materials of the industries, supply them to the artisans and go back to their markets with their assortment of wares The organisation of home industries has thus created an appropriate organisation of money lenders, traders and middlemen. The moral element involved in the artisan's work at home amidst the members of the family is highly efficacious. The collaboration of the family members not only economises expenses but sweetens labour. Culture and refinement come easily to the artisan through his work amidst his kith and kin. Again in the Indian industrial world there is no room for hard rivalry and indecent competition. The people have only one ambition, that of transmitting their patrimony, their land, or their immaterial wealth, their hereditary skill in ancestral handicraft, to their sons and grandsons, somehow maintaining themselves and their family members. They will not work more, in order to earn more money. They will be satisfied if they can get a morsel of food twice a day without being borrowers to anybody. This content, is born of racial habit. And to this content, the absence of any ambition or zeal to amass wealth, is due the stability of the Indian economic organisation. The Indian economic system never gets out of joints. Economic disorders are unknown in India. The Indian economic system is to be figured, not as the temporary equilibrium of rival forces, but rather as the permanent equilibrium when motion and energy are restricted in their operation in their proper spheres. The Indian industrial world does not therefore engender conflicts and disputes, strikes and lock-outs. On the other hand, it disciplines the people in healthy social relations. The craftsman's relations with the assistants and apprentices are most cordial, to which correspond certain well defined duties and obligations. The middlemen, the traders, or the money-lenders in their dealings with the craftsman are always straightforward. They do not exploit the labourer, but maintain him. The craftsman also looks towards them with due reverence. Indeed, all the relationships which are entered into in the industrial world, *e.g.*, between debtor and creditor, employer and employed, master artisan and apprentice artisan and trader, landlord and tenant and their duties and obligations call for a perpetual exercise of the social virtues and humanities It is for this reason that the Indian industrial world is more humanised and socialised and has lost more of the barbaric self-assertion and aggressiveness and acquired more patient dignity than the industrial world of the west which is without such discipline. And this discipline in healthy social intercourse has also found expression in the proverbially gracious and dignified manners and frank hospitality of the people. It has certainly made the life of the Indian more beautiful and enjoyable.

It is undoubted that the Indian character which has been the outcome of the discipline enforced by the characteristic social structure of the people cannot easily be modified in order that western industrialism can flourish in India. The contractual type of relations between man and man which western industrialism presupposes cannot soon be substituted for the existing type based on status, sanctified by traditional customs and usages and supported by popular songs, romance and folk-lore. It will be a miracle if the duties and obligations involved in our social relations are soon forgotten and merely monetary relations established in society.

It is, indeed, evident that the socio-economic institutions, laws, customs and character of the people cannot change their essential nature in the near future. The economic activities of the Indians will be carried on within the limits of the social environment and the moral conditions which it implies. Western industrialism presupposes the existence of other moral conditions and a different social environment. As long as there is no fundamental agreement of these in India and the west, the line of economic evolution will be different. This is the familiar doctrine of the relativity of social phenomena, the significance of which however is not even now fully understood. Western sociologists judge the progress of different peoples by an abstract and arbitrary standard deduced from the evolution of western civilisation. A recent writer on economic history asserts :—"The essential condition of all sound sociological enquiry is the comparative consideration of the entire series of the most complete evolution known to history, that, namely, of the group of nations forming what is known as the occidental commonwealth, or more briefly, the west." Such a view of social evolution which

regards the Hebraic-Graeco Romano-Gothic civilisation as representing the culmination of cultural progress and views the eastern types of culture "as if they were either monstrous or defective forms of life, or only primitive ancestral forms, the earlier steps of the series, that have found their completion in European society and civilisation" is essentially false. Dr. Brajendranath Seal who corrected this narrow view of human history remarked in his introduction to "Vaishnavism and Christianity:"—"With the ethnological material at our disposal, it is a gross and stupid blunder to link on Chinese, Hindu, Semitic, Greek, Roman, Gothic, Teutonic cultures, in one line of filiation, in one logical (if not chronological) series. No race or civilisation with a continuous history represents a single point or moment......Hindu culture, too, has passed through most of the stages observed in the growth of the Hebraic-Græco-Romano-Gothic civilisation. The same may be said of Arabic or Mahomedan culture. To conceive these statically, to reduce each living procession to a punctual moment in a single line is to miss their meaning and purpose.' In fact, the idea that western humanity represents the culmination of the ideal of humanity is based on the narrowness and prejudices of Western Sociologists. "Universal Humanity," says Dr. Seal, is not to be figured as the crest of an advancing wave, occupying but one place at any moment and leaving all behind a dead level. For universal humantiy is immanent everywhere and at every moment." And he continues, "the diverse ethnic types are all essential to the full unfolding of the plan and pattern of universal humanity, under our multiform geographical and historical conditions. The ideal of humanity is not completely unfolded in any race, for each race potentially contains the fulness of the ideal, but actually or explicitly renders a few phases only, involving other aspects more or less implicitly. To trace the outlines of the universal ideal, we must collate and compare the fragmentary imperfect reflections, not at all in eclectic fashion, but as we seek to discover a real species or genus among individual variations and modes. The loss or absence of a single note in this harmony would mar it fatally;—each colour is complementary to the rest; each geographical and historical environment requires its own type for perfect adaptation. The whole system of Nature, the entire process of history, would show a gap, a discontinuity, a wound, if one such thorough-bred type were suppressed, or obliterated, and the recuperative processes of evolution would slowly re-evolve the type, with proper modifications, and painfully heal the wound in the centuries to come."

From this broad, philosophical view of social evolution, the question of the adoption in India of the methods of western industrialism has to be solved. The economic institutions of the western countries are suited to their characteristic physical and social environment. They have their origin in the racial characteristics of the particular peoples inhabiting them. Similarly, the Indian geographical and historical environment has evolved its characteristic type ofeconomic organisation, and the future economic evolution must proceed along the lines of the past. The perfect economic organisation is that which is perfectly adapted to the environment, and in the forces of adaptation,the historical antecedents, and the racial characteristics of the people which have evolved in the past are too strong to be neglected. Thus, the attempt to force systems and methods of industrial organisation, economic arrangements and institutions which have admirably suited a different geographical environment will always be futile. In the first place, the people will not be able to work them successfully. Thus the struggle and the pain during the period of transition will be severe. Secondly, the institutions cannot be adapted to the geographical and historical conditions. Thus economic progress will be retarded, and in many cases economic activities will be paralysed. Lastly, the particular physical and social environment which requires its characteristic type of economic organisation for perfect adaptation will re-evolve the type, after a period of interference and forced substitution, and consequent stagnation, and degeneration.

These will be the inevitable results if the methods of industrial life in the west are introduced into the social organisation of India and the socio-economic traditions of our country neglected, on the pretext of the superior civilisation of the west. There is indeed no immutable superiority of certain racial types over others. Racial differences are the product of adaptation to different environments, and every race, even the most backward, can progress indefinitely, under favourable conditions of environment, physical and social, unfolding a phase of universal humanity and playing no small part in the development of humanity.

Such are the fundamental considerations which should guide a student of Indian economics determining the course of the future economic evolution of India. The problem

that should be uppermost in his mind would be this. How should India *modify* her present social environment, her existing socio-economic institutions and the moral conditions which these presuppose, in order that she can best develop the ethnic or cultural type which she represents ? India's economic progress has now been checked. What changes India's socio-economic institutions must undergo in order that India shall be economically progressive, and shall yet be India or a better India still, retaining and developing the Indian type and the Indian spirit, is the question which is now crying for solution.

HIGH WAGES.

By K. B. BHADRAPUR, M.A.

The problem of high wages affords to the thinking mind a variety of questions. What are the causes of high wages? What are their effects upon the working population ? Do they exert a beneficial influence upon the economic world? Do they affect the productive energies of a nation and if so, in what way? These are the various sides of the problem that naturally suggest themselves to us. However, without entering into all of them at once, let us confine our attention to the first query, *viz.* 'what are the causes of high wages?' The following enumeration explains itself :—

(1) Prices have risen during the last decade, *i.e.*, money has depreciated—the purchasing power of money has diminished. A certain quantity of it now buys less than what it bought before. Labour being a commodity as any other, must consequently increase in price.

(2) Industries including the premier industry, Agriculture, are making a steady advance ever crying for more and more hands Fallow land is being brought under cultivation. As the blue-books show, the area under cultivation has considerably increased of late. Increased demand for labour means high wages.

(3) Railways have attracted labour from neighbouring villages thus causing an unforeseen scarcity in some rural districts. A large amount of the country's labour is thus locked up in constructing and repairing railroads. Spinning and Weaving Mills in large and flourshing centres of trade—like Hubli, Gadag and Sholapur—have exerted a similar influence upon the agricultural industry in their neighbourhood. More than one new industries have sprung up and are competing with each other for labour. In this general scramble for labour and taking advantage of the troubled waters, Labour is fishing to its immense gain.

(4) Plague, cholera, are responsible for reduction of the wage-earning population. Increase of population has not kept pace with the growth of industries.

(5) It may be hazarded that the number of domestic servants and other unproductive hands ministering to personal conveniences might have increased.

(6) The standard of comfort has risen owing to the progress made by education, during the last few years. Cost of maintenance, *i.e.*, cost of labour, has risen. With the progress of civilization, we begin to value man and his services more and more. That is but natural; an educated man is paid more than an unskilled and untrained labourer. In rude and barbarous times, servants were looked upon as animate machines, as beings altogether of an inferior order. But now our idea of the working man has changed ; we look upon him as one, thinking and feeling like us—as our equal flesh of our flesh. The labourer has improved his position in the social scale ; this improvement cannot but tell upon his economic position. An untouchable labourer is now paid less than his other brethern of high castes though he works as well and as hard and even harder, than they. His low social position has kept him economically low also. If he improves his position or if the public recognizes his dignity, he also will get a higher remuneration for his services. Thus what we mean to drive at, is that the labouring classes have grown in the estimation of the people and consequently their economic position has inproved.

With the aid of democratizing credit and education, the labourer's love for independence is showing itself practically felt. He claims due respect from others and despises menial service and he is reluctant to accept service unless he is handsomely paid.

These then to be brief are the causes of high wages.

The Agricultural World.

Manure for the Banana.

The experiments of Mr. R. G. Bartlett in Ceylon, in the way of manuring bananas, show that potash is the essential portion of a banana manure, manures wanting in this agent being little or no good. Mr. Bartlett advocates the manuring of virgin land. The manure he found to give the best results financially consisted of 4 lbs. of dried blood, 2 lbs. sulphate of potash and 2½ lbs. superphosphate per stool.

The Branching of Rice.

The appearance of axillary shoots of rice of several varieties, showing on about 10 per cent. of the plants and maturing no grain but acting as suckers on the plant is ascribed to the irregular function of assimilation, enfeeblement of vegetative development, and excessive height of water in the field during sprouting. As preventive measures, unnecessarily late manuring, especially with nitrogenous materials, late weeding, and too high water during sprouting should be avoided.

Change of Seed.

A change of seed corn is very desirable every few years for all cereals, as with other crops, though little seems to be known as to the reasons for this Climate is, perhaps, quite as potent a factor as soil in this respect, and it is supposed to specially affect the time of ripening, according as it is earlier or later than the new locality to which the seed is brought. Opinions differ as to which of the cereals deteriorates most by constant growing in the same locality, and wheat, some declare, suffers more than either oats or barley in this respect, but this seems doubtful, as barley is peculiarly sensitive to climatic conditions, and has not the same stability as wheat in regard to variation.

Disinfecting a Cowshed.

The following formula for lime wash, with an added disinfectant, is recommended:—To prepare five gallons—Slake 7½ lbs. of lime, using hot water if necessary to start action. Mix to a creamy consistency with water. Stir in 15 fluid ounces of 95 per cent. pure liquid carbolic acid, and make up five gallons. Stir thoroughly and strain through a wire sieve, if it is to be applied by means of a spray nozzle. Where disease has been known to exist, not only should the entire cowshed be disinfected according to the above plan, but the floors also should be flooded with the lime and disinfectant wash combination.

New Use for Waste Milk.

A new and exceedingly profitable use has been discovered for the waste milk produced in such abundance by all creameries. There are places where this waste is used by the farmers who sell their cream to fatten pigs, but then again there are districts where the milk, thoroughly skimmed and watery in character is allowed to run down the drains. It has been found, however, that by mixing the milk with phosphate of lime a most efficient phosphate is produced. The phosphate of lime is placed in a hollow heap on the floor, the waste milk is run into the hollow, and a handful of yeast is added. In course of time the whole is turned and thoroughly mixed after the fashion of mortar. After it has dried and is broken up it is a most efficient fertiliser, containing about 7-30 per cent. of phosphate and a little more than 1 per cent. of nitrogen. Unlike the manufacture of most phosphates, this process is not attended by any of the disagreeable smells and other nuisances so closely associated with the ordinary fertiliser factory.—*Cowkeeper*.

Year Book of the Department of Agriculture, U. S. 1912.

This is the nineteenth number of a most important publication which is issued year after year, from the Department of Agriculture of

the United States of America. The book is divided into three parts :—in the first part the Report of the Secretary for the year 1912 is printed. In the second division are included the unpublished articles relating to subjects of general interest which have received special consideration during the year by the agricultural experts in the respective bureaus, and divisions, etc. The contributions cover a wide field and we hope to notice the more important of them in later issues of this journal.

An Appendix contains, beside the review of weather conditions, an official directory, statistics relating to agriculture in respect of production, acreage, value of crops and kindred items of interest. The area devoted to some of the chief crops for most of the countries of the world has also been published in the appendix.

The book should prove of value to all who are interested in agriculture. The statistics incorporated in the appendix bring under one cover the figures relating to the agriculture of most of the nations of the world.

Critical Constituents of Soil.

Nitrogen, phosphorus, potash and lime are the four "critical" constituents which every soil must contain if it is to be productive, and a chemical analysis reveals their presence or absence. A good soil to be termed rich must, according to Mr. L. V. Redman in the *Scientific American*, contain at least 0·4 per cent. of soluble potash, 0·25 per cent. of phosphoric acid, 1·0 per cent. soluble lime, and 0·25 per cent. of soluble nitrogen compounds. The other chemical elements, which make up the bulk of all soils, are generally present in large proportions, and considerable variation in the amount of these elements present is not critical. An analysis reveals the constituents of the soil and the amount of each element present.

When the chemist has determined the constituents present in any soil, he must further determine their availability. The constituent potash will serve to illustrate further the meaning of "availability." If potash is present in the soil as a constituent of the rock feldspar, it is "locked up" or not available, for the feldspar is practically insoluble ; however, if the soil be treated with land plaster or gypsum, the potash is changed into sulphate of potash, and is readily soluble and available for plant food.

The Agricultural Department in Ceylon.

The Secretary of State has sanctioned the scheme devised by Mr. Lyne, Director of Agriculture, for the new agricultural department in Ceylon.

The department will be organised as follows :—

(1) Division of Botany and Mycology ;
(2) Division of Experiments ;
(3) Division of Entomology ;
(4) Division of Chemistry and Rubber Research ;
(5) Division of Horticulture ;
(6) Division of Low country Products and School Gardens ; and
(7) Division of Agricultural Education.

Each of these divisions will be under a separate head, who will be entirely responsible to the Director for its proper conduct. Probably the most important of these sub-departments will be that dealing with chemistry, and rubber research, and it is stated that Mr. L. E. Campbell, a Member of the Staff of the Scientific and Technical Departments of the Imperial Institute, has been appointed rubber specialist to carry out the local investigations, and has just arrived in Ceylon. It has been decided that Mr. Campbell should be under the control of the department of Agriculture, instead of being directly under the control of the committee, though he will of course work on lines laid down by the Rubber Research Committee.

Small Holdings.

What was said recently by its President the Hon. Luigi Luzzatti at a Congress of Small Land Holders for Modern Italian Agricultural Economy, applies *mutatis mutandis* to India.

He asked for relief, in accordance with a sliding scale, for the smaller holdings, from

the land tax now burdening country holdings and farm buildings, and also for relief in due measure from taxation on the deeds in connection with the proper rounding off of small farms. These fiscal facilities and exemptions, on which modern reforms depend, will do, he said, with greater social effect, for the owners of real estate, what has been done for the the payer of small taxes on personal estate. It is besides necessary to promote the development of *agricultural co-operative* and *mutual* societies, encouraging their constitution and work. Further, it is necessary that "special Agricultural Credit Societies, and among these, in the first place, saving's banks and people's banks, coming more and more into contact with the country people, should be enabled (the Government even assisting and undertaking to regulate the rate of interest), to complete the operations facilitating the acquisition of small farms, to grant loans for improvements, and to assist in the reparation of damage caused by the elements."

"It is further to be recommended that land belonging to the State, the provinces or the communes and uncultivated land held by various organizations or private persons should be assigned in perpetual lease to poor farmers.

Watering.

No hard and fast rules can be laid down about watering. It has a philosophy of its own, observes the *Tropical Agriculturist.* We must know something about the water requirements of the plant, and we must have a clear idea as to the nature of the reservoir—the soil—in which is stored the water absorbed by plants.

First, it is to be observed that plants consist mainly of water. In a dry seed such as a pea there is about 10 per cent., and in a lettuce leaf something like 85 90 per cent. of water. There are other yet more watery vegetables which consist of no less than 99 per cent. of water.

Secondly, a plant utilises for one purpose or another during its growing period an amount of water many times greater than its own bulk. This stream of water, which passes through the plant, comes from the soil and escapes as vapour from the leaves. In that stream the mineral substances—essential to the building up of the living material—are carried to the leaves, and by the evaporation of the water from the leaf and other surfaces, the temperature of the plant is regulated.

Thirdly, the roots of a plant require not only water, but air, and therefore a constantly saturated soil is fatal to the health of nearly all plants.

Fourthly, and speaking generally, there is a relation between amount of water and the state of the plant. The nature of this relation may be judged from the fact that it is possible to prevent plants from flowering, whilst maintaining them in healthy vegetative growth by supplying them continuously with plenty of water.

Indeed, it might be said that every plant requires a longer or shorter period of rest between its growing vegetative period and its flowering period, and that during this period it requires to be kept drier than at other times.

An experiment carried out by M. A. Petit, Professor of the French National School of Horticulture illustrated the slight effect of light watering and the big effect of thorough watering and the fact, not well realised, that a too copious and frequent watering is useless and indeed often harmful.

There is a well established prejudice against watering in the middle of a bright sunny day. The explanation is if water is added to dry earth, during the day a considerable quantity of heat is disengaged, which brings about serious damage to the roots.

Explosives in Agriculture.

We drew the attention of our readers to the use of dynamite in agriculture in page 741 of the *Wealth of India* for November 1913. We find in a recent number of the *Queensland Agricultural Journal* an interesting article written by Mr. F. R. Treleaven, New Farm, Brisbane, on the employment of explosives in agriculture. The remarkable results attained

by him were the outcome of a thorough study and elaborate experiment covering a period of the past eleven years and he assures us that the efficiency of explosives on the land has been thoroughly tested, and successfully demonstrated as to their value on subsoiling, the splitting of logs for burning and fencing purposes, the cutting through of logs for rolling together to burn, the cutting of waterways, and the draining of land in letting through surface water where practicable.

A great part of the article is highly technical dealing with the details of dynamiting. What is of most interest to us however is the subsoiling that explosives play for the benefit of the farmer. Subsoiling should not be attempted when the ground is wet. It should be done in dry weather. In damp ground and in certain soils, the explosive tends to harden and pug the soil where the explosive has spent its energy on the outside limit ; whereas in dry ground the force of the blast runs out a greater distance, and loosens up on a nice even basis. The depth of the holes varies from 2 ft. 6 in. to 1½ ft., according to "the nature of the soil." This also applies to the distance the shots should be apart, which may vary from 7 to 18 ft., and the quantity of explosive used may be from a half to two plugs, say, of gelignite. A farmer, in subsoiling, should take the class of explosive he intends to use, make two or three trial shots, and then use the crowbar adjacent to the explosion, which will give him a good idea of the distance to which the charge has penetrated. A great upheaval of the soil is not expected. This is not what is required. The ground should have the appearance of having been on the boil, and thus settled and shaken up. This is what is required ; so study the subsoil, which is the home of the roots and the source of plant food. Farmers should not get the idea that their farms are impoverished through years of cropping, for they have only scratched the surface soil by ploughing. Land that has been under crop for twenty years can practically be restored to its virgin state with the aid of explosives. There is no need to dispose of the farm with the idea that all the good out of the land has been taken out. It is far from it. Subsoiling means—

(1) the utilising of the fertilising elements of the subsoil ;
(2) storage of rainfall in the subsoil ;
(3) good drainage ;
(4) atmospheric influences penetrate the subsoil ;
(5) the roots obtain their nourishment from it ;
(6) destruction of field mice, etc. ;
(7) advantage of getting sooner on to the land for cultivation ; and
(8) bountiful crops.

An idea of the cost of subsoiling with explosives is given by Mr. H .C. Coggins, in the *Agricultural Gazette of New South Wales*, who gives his testimony also to the use of explosives for the various purposes already mentioned by Mr. Treleaven: –

Table showing cost of Subsoiling with Explosive.

Distance of Holes Apart.	Charge.	Number of Holes per Acre	Number of lb. per Acre.	Number of Feet of Fuse per Acre in 3-ft. holes.	Number of Detonators per Acre.	Total Cost per Acre.
Feet.	Plug.					£ s. d.
10	½	435	21¾	1,305	435	2 12 9
10	1	435	43½	1,305	435	3 14 6
12	½	302	15	906	302	1 16 6
12	1	302	30	906	302	2 11 6
15	½	194	10	582	194	1 3 10
15	1	194	20	582	194	1 13 11
18	½	128	6¼	384	128	0 16 4
18	1	128	12½	384	128	1 0 7
20	½	109	5	327	109	0 12 9
20	1	109	10¼	327	109	0 18 0

Drug Culture in India.

In the course of an article on the subject, the *Chemist and Druggist* writes:—A noteworthy addition to the evidence which is accumulating in favour of the successful cultivation of drugs within the British Empire is afforded by the publication of two monographs by Mr. David Hooper, F.I.C, of the Indian Museum, Calcutta, and by Mr Puran Singh, F.C.S., of the Indian Forest Department, Dehra Dun, on the cultivation of drugs in India. Mr. Hooper, states in his paper, that one-half of the drugs in the British Pharmacopœia are indigenous to the East Indies, and nearly the whole of the rest could be cultivated or exploited. The following are given as those that could be grown in quantity and as worthy of the attention of cultivators and capitalists:—

Belladonna, most of which is still imported, grows well in the Western Himalayas from Simla to Kashmir, the Indian-grown plant containing 0·4 to 0·45 per cent. of alkaloid.

Digitalis is quite acclimatised on the Nilgiris, growing there without any attention. The Madras Store Department obtains all its requirements from Ootacamund, and the leaf has been found equally active to that grown in England.

Henbane is a native of the temperate Himalayas from 8,000 to 11,000 feet. It was introduced into the Botanic Gardens, Saharanpur, in 1840, and it has been steadily cultivated there up to the present time, and the products supplied to medical depots satisfy the annual demand.

Ipecacuanha has been raised with a small measure of success in the hilly parts of India, and it only requires care and attention to raise it in sufficient amount to make it commercially remunerative.

Jalap-root grows as easily as potatoes in the Nilgiris, and there is no reason why the annual requirements (about 4,000 lb.) for the medical stores of Bengal, Bombay, and Madras should not be obtained from Ootacamund.

Mr. Puran Singh discusses the subject in the *Indian Forester* for March. He states that most of the drugs in the British Pharmacopœia grow wild in India, and that there is already a large export trade for some of them. He adds, however, that materials collected at random cannot be expected to fetch full prices, as they seldom come up to standard quality, and he adds:—The few drugs that are not indigenous to India could easily be made to grow in some part or other of this vast land. The great advantage accruing from the systematic cultivation of drugs is that a regular supply of genuine drugs of standard quality is assured. The variation in the quality of wlid-grown drugs is sometimes a very serious drawback to finding a profitable market for them. The quality of *Podophyllum Emodi* growing wild in India is an illustration in point. This plant was discovered by Sir George Watt in the year 1888, and now, even after twenty-four years, in which it has been shown to be identical with the American drug that is being employed for pharmaceutical purposes, it still remains unrecognised by the British Pharmacopœia, which as explained by the *Chemist and Druggist*, some time ago, is solely due to the uncertainty which still exists as to its physiological activity. This uncertainty can only be reduced to the minimum by artificial cultivation of the plant under uniform conditions and collecting at the proper season.

Mr. Singh also points out that the Indian consumers of medicine depend mostly on herbs growing wild in the forests, the more important of these probably numbering at least 1,000. This inland trade is very large; the possibilities in the Punjab only being put at Rs. 50,00,000. He mentions saffron, liquorice, and salep as products exotic to India, whose cultivation in that country looks full of promise. Mr. Singh suggests that a complete survey be made of the extent of the inland trade in medicinal products found growing wild in Indian forests in order to arrive at the figures of annual consumption, and that the forest areas where the most important drugs grow should be preserved. Inquiries should be instituted as to the best methods of cultivation, and, if need be, the means of extending

the artificial propagation. It is to provide data to induce the private capitalist to embark on such enterprises that Mr. Singh advocates the formation of some body to go into the matter. He suggests that India is well worthy of attention by those in this country who are interested in extending the culture of drugs in the British Empire. It is noteworthy that the Forest Department has already begun the cultivation of Indian podophyllum root in the Punjab, United Provinces and the North-Western Frontier, and that several maunds of dried rhizome are sold annually for local consumption. Mr. Hooper also shows that a start has been made in regard to the cultivation of belladonna, henbane and digitalis. One of the principal difficulties to be overcome is to ensure a ready market, and there is also always the danger of over-production to be considered.

Scarcity of Cattle in India.

There is a very instructive article on the above subject in the *Hindustan Review* for October-November of 1913. The writer, Mr. S. Kamath, supports his conclusions by statistics derived from official publications, which, though not quite accurate, are, in his opinion, sufficiently illuminating.

He proves the inadequacy of cattle for agricultural purposes from the following table composed from the figures supplied by the Government :—

Figures are in Millions.

1 Province.	2 Bulls and He-Buffaloes.	3 Acres of cultivated land.	4 Ratio of 2 to 3.
British India ...	45·6	223·0	5·0
Bengal ...	10·4	36·6	3·5
Bombay ...	2·9	25·3	8·5
Madras ...	7·3	33·7	4·5
Agra ...	7·5	26·9	3·6
Punjab ...	4·8	24·8	5·1
Central Provinces ...	3·5	17·7	5·0
Oudh ...	3·3	9·3	2·9

From these figures, the writer calculates that no province in India has a bull or he-buffaloe for even three acres of cultivated land. The province of Bombay, is the most backward of all, there being only one of these for every 8·5 acres. The last cattle census was taken in that presidency in 1910-11 and the two famines that raged in and around the district of Ahmedabad must have rendered the position much more serious. To illustrate fully the scarcity of cattle necessary for agricultural purposes, the following table, showing the pairs of bulls and buffaloes for each available plough are given :—

Province.	Bulls, etc., in pairs.	No. of ploughs.	Pairs of cattle per plough.	Acres served by one plough.
British India ...	22·8	19·6	1·1	5
Bengal ...	5·2	4·7	1·1	3·5
Bombay ...	1·5	1·0	1·4	8·5
Madras ...	3·6	3·8	0·95	4·5
Agra ...	3·8	3·3	1·2	3·6
Punjab ...	2·4	2·1	1·2	5·1
Central Provinces.	1·8	1·1	1·6	5·0
Oudh ...	1·7	1·5	1·1	2·9

Thus the only province that can be said to have the sufficient number of cattle to use the ploughs are the Central Provinces. In giving the number of bulls and he-buffaloes, no allowance has been made for those that are used exclusively for drawing carts. Their number is surely large and if allowance is to be made for them, even the Central Provinces will not be able to show a pair for each plough that is used.

The writer makes mention of two other disastrous effects on this country due to the poor number of cattle. He says that our agriculturists, being ignorant of the method of preparing manure from chemical products such as bones, depend for it mainly on the excreta of cattle. In the whole of India, there are only 90 millions of cattle including the

cows and these are, in the writer's opinion, to supply manure for 223 millions acres of cultivated land. A vast portion of the excreta is used for fuel and even leaving such loss out of account, nearly 2½ acres of land have to be content with the manure produced by one head of cattle.

The other serious matter is with regard to the milk supplied. The 315 millions of people in India have to depend on the milk supplied by only 40 millions of cows and she-buffaloes and since these do not supply milk during half of their life time, nearly 15 human beings are dependent upon the milk of one cow. No wonder, says the writer, that infant mortality in India is so appalling.

The salvation from this situation now lies, in the writer's opinion, in the improvement of veterinary assistance. The following table is given to show how limited is that Department now :—

Province.	No of cattle in millions.	No. of veterinary assistants.	Average No. of cattle for each assistant in millions.
British India ...	89·5	814	·109
Bengal	20·5	61	·33
Bombay	11·4	47	·24
Madras	14·4	66	·22
Agra and Oudh ...	20·8	140	·14
Punjab	10·3	169	·06
Central Provinces ...	6·6	90	·072

"These figures reveal a really serious state of affairs in this country. In the whole of British India, a veterinary assistant has, on average, to look after nearly 109,000 cattle, a feat physically impossible for him. Then again, all the provinces are not equally well supplied with them. The Punjab heads the list with one assistant for every 60,000 cattle, whereas in Bengal, there is one for nearly five times that number. Their number in any province is not even in accordance with its needs. They should have been in excess when cattle are rarer. In Bombay, as can be seen from the first table, there is one bull or he-buffaloe for every 8·5 acres of land, whereas in the Punjab, there is one of these for only 5 acres. Cows and she-buffaloes too are distributed in almost the same ratio."

The Disinfection of Sick Soils.

In the report just published on the working of the Rothamsted Experiment Station during 1912, Dr. Russell, the new Director of this well-known scientific agricultural centre, makes some interesting and valuable remarks on the important subject of soil fertility. Great advances have been made in the knowledge of soils in their relation to the growth of plants in recent years. The old view that the fertility of soils depended entirely on their chemical and physical condition has now had to be given up in favour of theories in which these attributes—although essential—are associated with, in fact, are subsidiary to, the biological conditions. Through the bacterial life of the soil the principal plant food, nitrogen, is selected and prepared for assimilation, and although the nitrogen may be there, and although the physical condition may be such as favours bacterial development, the soil from a plant point of view is useless, unless the biological position is satisfactory. Quite lately, by the researches of Messrs. Russell and Hutchinson, further light has been thrown upon the biology and the biological processes of the soil, and in the report under review, Dr. Russell sums up the position of the question as it now stands. The production of ammonia and nitrates, he says, which are plant foods of the higher importance, is to a very great extent the work of bacteria. In normal soils these particular bacteria are not working at their full efficiency. An agency has been discovered which limits the numbers of these bacteria, and consequently the amount of work done by them. Up to now all the evidence available goes to show that this agency is biological. It is capable of growth, is put out of action by heat and anti-

septics, and can only be set up by infection from outside. It is not bacterial, and there is reason to believe that it can be identified with the protozoa—the early forms of life—of which numbers have been found in all the soils examined. Partially sterilised soils, from which this agency has been eliminated, are found to contain larger numbers of bacteria than untreated soils, to accumulate ammonia and nitrates at a great rate ; in fact to become more productive. Dr. Russell's view of the whole matter is that the soil organisms may be roughly divided into two groups in their relation to the processes of food production, a useful group and a detrimental one. The latter are, generally speaking, more readily killed than the former. Conditions, therefore, which are harmful to active life in the soil tend to diminish the number of these, and thus lead to an increased activity of the useful bacteria. On the other hand, conditions favourable to active life tend to develop the detrimental organisms, and therefore to reduce the useful bacteria. "We have thus been able," says Dr. Russell, "to render intelligible a number of obscure and paradoxical effects that have hitherto caused considerable perplexity." Practical agriculturists have all along recognized that certain soil conditions harmful to the growth of organisms, such as frost, long droughts, treatment with large dressings of lime, &c., were ultimately beneficial to productiveness. On the other hand, as Dr. Russell says, the combination of warmth, moisture and organic manures, such as is found in glass-houses, which are undoubtedly favourable to life, lead to reduced productiveness after a time. These apparent paradoxes are now easily explained. These modern views on the subject of soils are also of special interest to tropical agriculturists. In the tropics, "sick" soils, that is to say soils in which the chemical and physical properties are good, that are adequately supplied with the constituents essential to plant life, and whose mechanical properties are all that can be desired, but which absolutely refuse to grow paying crops, have been a constant source of trouble and perplexity. Chemistry has failed to point out any defect, while the skill and experience of practical agriculturists are of no avail in connection with them. Dr. Russell's views supply an explanation. Tropical climatic conditions, as a rule, are particularly favourable to vegetable life, especially the lower forms. These "sick" soils probably harbour such a proportion of the hostile protozoa as practically to nullify the beneficent bacterial work. In connection with the sugar-cane experiments in Porto Rico, it has been shown that sick soils may be rendered productive by the use of such disinfectant as carbon bi-sulphide, whose first destructive action would be on the protozoa. When a cheap form of disinfectant is found, the use of bi-sulphide of carbon being as a rule economically out of the question, there will be, if Dr Russell's views are correct, no more sick soils. But the subject is deeper than this. If normal soils, that is soils of ordinary productiveness, are disinfected periodically, the yielding powers will be enormously increased. It would appear, therefore, that we are on the eve of a new item being introduced into the routine of agriculture. Hitherto the system has been: "drain, till, manure." In the future this may become "drain, till, disinfect, manure." It is obvious, from what Dr. Russell says, that to manure highly protozoic soils with stimulating manure, such as sulphate of ammonia, is to court disaster. In a like manner the full effect of these normal soils is not gained under the present system of cultivation. The whole question of the applicability of these views to practical agriculture, as mentioned above, turns upon the cost of disinfection. As to this, Dr. Russell says that the "method of partial sterilisation has now passed out of the laboratory into the hands of the practical man, and each season becomes cheaper and applicable to a wide range of growers." Agriculturists will be glad also to learn that methods are being arranged for the application of the principle of the disinfection of soil on a large and working scale.—*The West India Committee Circular.*

The Co-operative World.

Old Debts of Members.

Rao Sahib K. G. Damle, Chairman of the Akola Central Bank, submitted to the last Conference of the Registrars of Co-operative Credit Societies a paper on the best methods of dealing with the old debts of members. He stated that for a successful experiment of co-operative working in a Village Credit Society, steps should be taken to wipe off the outside money-liabilities of its members. For, he said, the co-operative influence would have effect on the material condition of the members, only if it arranged to free them from the control of the money lender (the village sowkar). In his opinion, therefore, it seemed absolutely necessary that a Co-operative Credit Society must perform all the functions of a village sowkar. Speaking of his province, to give the members who are mostly agriculturists an appropriate relief, long-term loans seemed inevitable, especially as a sufficient allowance was to be made for unforeseen calamities such as famine, distress, failure of crops and other local or individual mishaps, which interfered with their ordinary capacity to repay. He showed that without long-term loans a Co-operative Credit Society could not show successful results. At the same time, such long-term loans could not be granted consistently with business practice, unless the society offered a substantial security. This consists of land and moveables. But as the members are poor, their moveables are worthless as security. He stated that in practical working this question of long-term loans is beset with innumerable difficulties, the more so, because land tenure differed so widely from province to province. He wanted to know what the experiences of the Conference members were.

A long discussion followed, in which Mr. Lalubhai Samaldas said that, in Dharwar, societies had paid debts to the amount of Rs. 80,000 of their members without getting money elsewhere. Mr. Ewbank added that in one case in Gujarat they called up the entire village; and three-fourths of the villagers, including all the best cultivators, declined to liquidate their old debts on the ground that they were borrowing money from the sowkars at 6 per cent., whereas they had to pay the Co-operative Societies $9\frac{3}{8}$ per cent. Security of mortgage with possession was generally taken; but in those cases where a man had no land, only small debts were allowed. Mr. Wilberforce said that there were two kinds of debts—secured and unsecured debts. On secured debts the interest was not high, but on unsecured debts, it was very high. It was, Mr. Wilberforce said, easy to pay unsecured debts, as there was a great difference between the rates charged by sowkars and Co-operative Societies. Mr. Crosthwaite agreed that restrictions on transfer of land and co-operation were incompatible. Mr. Wilberforce remarked that alienation of land to money-lenders was prohibited in the Punjab. Mr. Crosthwaite said that, in the Central Provinces, temporary mortgages were not permissible. Mr. Mitra said that, in Bengal, land could not be transferred without the consent of the Zamindar. Mr. Crosthwaite said no progress in co-operation was made in Hungary until power of transfer of land was given. The different methods of procedure adopted in the several provinces were then discussed and the President concluded that no general rules could be laid down as the law regarding the alienation of land differed in different provinces.

Industrial Co-operation in England.

Mr. G. N. Barnes, M. P., paid a tribute to the co-operative movement the other day, when talking to Woolwich co-operators, which, says the *Hindu*, deserves to be noted. He expressed surprise that it should be found necessary to hold propaganda meetings in

order to bring people into the fold of co-operation, because it appeared to him that the benefits of the movement were so obvious that people ought to come into it without being asked to do He stated further that it was his lot to go about the country a good deal, and wherever he had gone, he was bound to say from actual experience and observation that the wages and hours of work and everything appertaining to the ordinary daily toil of the work people were immeasurably better in co-operative works than in the ordinary workshops of capitalist enterprise. The problems before Industrial Co-operation in England were many, but the profitable and useful investment of the capital of the Societies in co-operative undertaking was one which needed most urgent and careful attention. In a lecture delivered recently, Professor Hall gave certain statistics which showed how much has been done in this respect and how much remained to be accomplished. In 1909 the capital of retail societies amounted to—Share, £30,815,300; loan, £4,780,000; a total of £35,595,000. Of this amount, £20,405,000 was invested outside the societies, leaving £15,190,000 invested in their own businesses. Of the £20,405,000 invested outside societies, £7,727,000 was invested in house property, leaving £12,678,000 in other investments. Of the latter amount, £7,613,000 was invested in the wholesale societies, £262,000 in corn-milling societies, £525,000 in other associations of consumers, and £289,000 in productive societies, exclusive of agriculture. That gave a total of £8,693,000 invested in co-operative undertakings outside the distributive societies, which left a margin of approximately four million pounds invested in non-co-operative undertakings in addition to £2,07,000 reserve and insurance funds which the societies had. Some of these funds were invested in Railways and Corporation stock, but it meant that nearly 20 per cent. of the capital of the distributive societies was invested in non- co operative undertakings, and was available for co-operative extensions, in addition to amounts which the wholesale societies had invested outside. The retail societies did a trade of £70,423,000, which meant that the capital engaged in their own business was turned over about four-and-a-half times a year; and that with a membership of 2,469 000, the average amount of capital per member was appoximately £14. Some societies invested their funds in purely co-operative undertakings or public stocks ; but others had more money invested in non-co operative than in co-operative trading concerns. The lecturer suggested reasons for this. The establishment of an investment society with which the surplus capital of the individual societies could be investedhad been suggested. The special purpose of this society would be to specialise in the work of investing the funds and secure remunerative openings. It would also help co-operative undertakings when requiring capital. The lecturer also pointed out that while the total trade was £70 millon the production of societies amounted only to £24½ million. Here was a great field for development.

Practical Difficulties in Rural Societies.

In a paper presented to the last Conference of the Registrars of Co-operative Societies held at Simla, Mr. M. G. Deshpande (Central Provinces), detailed some practical difficulties in the management of Rural Co-operative Societies. At the outset he said that the material out of which they had to form the Co-operative Societies was poor. The masses in India are mostly illiterate. Their progress in life has been always very, very slow. They shrank from altering their ancient and time-honoured customs, even in the matter of using new and up-to-date labour saving devices. To these difficulties must be added the interests of the sowkar, which are in direct conflict with those of the masses and the sowkar raised strong prejudices in the minds of the poor against the movement.

Then, continued Mr. Deshpande, there were the social disunions and party factions existing in every village. Among other drawbacks, he mentioned the general unwillingness of debtors

to give details of their liabilities. Besides, the capital required for the liquidation of old debts would be enormous. Another difficulty that occurred to the writer was the indebtedness of the ryots to the grain-lenders. Money-lenders are generally grain lenders also. The agriculturists fall in need of grain to pay the labourers who are paid in kind, not in cash.

One further difficulty, he said, was experienced at some places by the Secretaries of Central Banks. In some places shareholders were not so respectable and rich as to undertake the custody of large amounts; and even if they were willing to help, Central Banks were not prepared to accept their assistance. At such places the secretaries had to keep cash with firms that were not shareholders. Mr. Deshpande considered it necessary that the Government should help by allowing the Secretary to deposit cash in the Government Treasury.

One peculiar difficulty found in his provinces (Central Provinces) was mentioned. The non-transferable nature of occupancy and tenancy lands had resulted in the notorious system of surrender and release, entailing upon the transferer of the land the expense of what was called consent money paid to the landlord to make him a party in that illegal affair, thereby reducing the value of the land to the extent of the consent money. Mr. Deshpande suggested to the conference that the Government should make an exception when the proposed transfer was to a Co-operative Society.

A brief discussion followed the reading of the paper. Mr. Chatterjee (United Provinces), said that a number of societies in the same village crystallised party feeling, at least in his Province; though Mr. Crosthwaite thought, that it had generally the opposite effect. Mr. Damle explained the practice in Berar. He said that in a village, in which there were a a number of societies, they worked harmoniously. Mr. Lalubhai Samaldas asked if a man could be a member of more than one society. Mr. Crostwhaite said "No", as in that case it was impossible to check his borrowings. With reference to the statement in Mr. Deshpande's paper that in some places the secretaries had to keep cash with firms which were not shareholders, Mr. Crosthwaite, in reply to a question by Lalubhai Samaldas, said that no money was entrusted to any one who was not approved by the Registrar. Mr. Chatterjee asked if it was the function of the director to decide what loans should be given. Mr. Crosthwaite replied that the members themselves decided it. Mr. Swamikannu Pillai said that in Madras money was entrusted to the Panchayet for distribution. Sometimes it happened that the panchayet appropriated a considerable part of the loan and there was trouble later on.

Co-operative Dairying in Ireland.

In an interesting paper on co-operative Dairying in Ireland which Mr. R. A. Anderson, Secretary of the Irish Agricultural Organisation Society, read recently before a meeting convened under the auspices of the British Dairy Farmers' Association, he reviewed in brief the progress of co-operative dairying in Ireland for the past fourteen years. There were in 1889 only 181 co-operative creameries in Ireland yielding butter to the value of £750,000. That the farmers though uneducated had sufficiently recognised the usefulness of co-operation is evident from the fact that the societies according to the recent report have increased in number to 413 and the value of butter has gone up to £2,000,000. It is a matter well-worthy of being mentioned here that Ireland is now gradually advancing and perfecting the organisation of her dairying business in such a manner as to enable her farmers to hold their own in competition with the farmers of other countries. Any casual visitor to one of the creameries will be convinced of the earnest and honest desire to do honest work on the part of its workers and promoters. Opportunities are availed of to impress well on the minds of the staff and workmen that their creameries will be judged on the quality of butter produced and that mediocrity in anything means stagnation and dry rot.

With a view to facilitate the work and to carry it out effectively and profitably the Irish Co-operative Creamery Butter Control has been newly organised. The object of this control is to level up the quality of butter and to produce it more economically enabling it to be sold more cheaply. A trade mark has been registered for the control and the participating creameries only are allowed to use it. Butter vouched for by a registered trade mark will surely command a good market in preference to others. To keep up the required standard of excellence and to secure the confidence and respect of customers the conditions of participation in the control are sufficiently rigorous and it is left to the entire discretion of the I. A. O. S. to admit new creameries. Every creamery joining the scheme has to satisfy the I. A. O. S. as to the efficiency of its management, to agree to pasteurise its milk or cream, to maintain a condition of absolute cleanliness, to ripen its cream by means of pure culture before churning, to guarantee that the percentage of moisture in the butter produced did not exceed 16, to send by-monthly samples of its butter for bacteriological analysis, to retain samples of every churning for inspection, to make periodical returns of its trade, to affix to every package a label bearing the trade mark of the Control, and to keep records of every transaction in such a manner as to enable any package to be traced back to its original source. For the privilege of participating in the scheme, every society is obliged to be affiliated to the I. A. O. S., and to pay a toll of at least one penny per cwt. on all butter sold.

The participating creameries have, during their short period of experience, realised better prices and readier market for their butter. Ere long it is hoped that no creamery will forego the advantage of such a useful scheme designed solely for their betterment.

Referring to the useful activities of the I. A. O. S. Mr. Anderson alludes to the formation of cow-testing societies. On an average the Irish cow produces about 450 gallons of milk per annum. He suggests how the milk-producing capacity of the cow may be increased to 600 gallons in a very short time and the productivity of the dairy herd increased by 33 per cent. without in the least impairing the beef-producing qualities of the cows. He says :—

The methods employed are very simple; the volume of milk given by each cow is ascertained by weight, and the percentage of butter-fat is determined by test, the weight of the milk and the percentage of fats which it contains being recorded. The unprofitable milkers are ascertained and weeded out and the profitable ones retained. On the potentialities of the butter trade, he observes that the future prosperity of Ireland lies rather in the production of butter, bacon, etc., than either in raising store cattle or the production of beef. The extension of dairying would be followed by a great increase in pig rearing and feeding and poultry keeping; for these two industries are the necessary concomitants of the former. In this development lies the solution of the agricultural labour problem in Ireland and it will be found the truest and best source of prosperity of the farming industry. Winter dairying is a problem to the Irish Dairy men, for it is obvious that no system of dairying is complete which does not aim at all-the-year-round production.

"To effect this our farmers will have to take to tillage, and must be instructed and induced to till intelligently. We are faced with a very complicated labour problem in Ireland, and the production of suitable crops for the winter feeding of cows can only be rendered economically possible by the use of the most up-to-date labour-saving appliances. We have got to show the farmer that winter dairying is essential, and we have to demonstrate that it will pay. Winter dairying will make it quite possible to increase our butter-producing area very considerably. At present dairying in Ireland is mainly confined to those parts where the cows are mainly fed upon grass.

" Nothing, in my opinion, would be so well calculated to increase the prosperity of the

country as the extension of dairying to tillage districts, and to those where store cattle are now fed."

Co-operation for Indian Mill Hands.

At a meeting of the Provincial Conference of Co-operative Credit Societies convened in the Council Hall, Poona, some time ago, Mr. G. K. Devadhar of the Servants of India Society, said it was a matter of satisfaction that the subject of the unsatisfactory condition of the mill-hands was receiving the greatest attention at the hands of those to whose care they had come to be entrusted, and that the bulk of the mill-owners were now roused to the consciousness that there was something wrong in the condition of the mill-labourers which deserved to be righted as early as possible.

THE LABOURING CLASSES.

It might be asked, said Mr. Devadhar, are the mill-hands, who are a steadily growing class in this country among the labouring population, a fit object for co-operative movement both on account of their habits and their economic position?

"My firm answer to this question is in the affirmative. In my opinion the condition of our labouring classes does not materially differ from the condition of our agriculturists. These tally in their main features, and a detailed examination of these will show that if co-operation could be successfully launched in mitigating the miseries of the agriculturists, there is no reason why our labouring classes should not be made to reap the benefits of co-operation if its man-making principles be made applicable to their daily life.

"The Indian mill hand, hemmed in on all sides by the above-mentioned disqualifications, entertains no ambition of getting his position bettered, and he more or less resigns himself to his lot. But my belief is that if we gradually take them in hand, the work of helping them out of their present economic depression is sure to yield good fruit."

CREDIT SOCIETIES FOR MILL-HANDS.

Mr. Devadhar, after outlining the operations of four mill-hand societies in Bombay, proceeded to outline his proposals for the formation of Co-operative Credit Societies for mill-hands. They are that a mill should be selected in which will be found a large number of needy mill-hands who are sick of being indebted and some of whom are able to read and write. Mill-owners should find out a few volunteers who would assist them in delivering about half a dozen lectures and lantern shows on the movement of co-operation, its progress in the West and in India, and its possibilities for the poor mill-hands. They should also explain the bye-laws and the working of such a society.

When a dozen mill-hands intelligently agree to form such a society, it should be started preferably in a mill. Its affairs should be managed by a Managing Committee of its own members with certain limitations. There should be a Board of supervisors to guide, to supervise, and control the transaction of the Managing Committee of the society in respect of loans from outsiders and to members. The Board should consist of five persons; one of them should be the mill agent, the other should either be the Manager or the Head Jobber, the third should be a Pleader, the fourth should be an Accountant, and the fifth should be a Preacher of co-operation. As far as possible, the society should not be considered a part of the mill-machinery but its useful adjunct, so as to secure the greatest educational effect. Membership ought not to be made compulsory, but members should be attracted after careful selection by preaching, moral persuasion, and the example of their fellow-workers. Women should be included among members. It should be a limited libility society in order to secure greater and more direct financial interest of the mill-hands concerned. There should be a proportionate liability extending over two years.

The capital should be raised partly by the shares of members to be paid in small monthly instalments, partly by the fixed deposits from those members who are better off, partly by the compulsory small savings of members provided for in the bye-laws after

the share money has been paid, and partly by proportionate loans or deposits from the mill-owners and lastly by donations. Outside loans should as a rule bear half the rate of interest charged to members on loans made by the society to them. There should be two classes of loans; short term loans, for ordinary needs, and long term loans for redeeming lands or liquidating old debts. In addition to the usual procedure of taking two sureties there should be collateral security on long term loans.

The next step to this should be a co-operative store, first to deal in a few articles to be worked on the principles of the Rochdale Pioneers. Profits should be converted into shares. A further step should be a co-operative hotel or a refreshment room. The last step should be co-operative insurance. The Central Committee formed to guide the policy of such work should engage two paid servants to daily keep themselves in touch with the working of the societies by visiting the secretary, by attending their meetings, by inspecting the accounts and by advising the committee. Government inspection and audit should be quarterly. In the beginning Government should give some loan for over a period of five years at a moderate rate of interest.

Credit Associations in Canada.

The system of Co-operative Credit introduced into the Province of Quebec is a combination of the essential characteristics of the systems obtaining in Germany, France, Holland and Denmark. For a time, the Co-operative Credit Societies of Canada, known as "*La Caisse Populaire de Levis*" remained purely voluntary institutions; but in the year 1906, the Quebec Syndicates Act was passed, which provided for the formation of Co-operative Societies among the labouring classes of the province for production, consumption and credit, each such association operating within the limits of a provincial electoral district. It is reported in a recent number of the *Monthly Bulletin of Economic and Social Intelligence* that in 1912 there were 98 *Caisses Populaires* in the Province of Quebec, besides several in Ontario. The associations are without exception doing well, and their number is rapidly increasing.

The report is further interesting as showing the working of *La Caisse*.

OBJECTS OF THE ASSOCIATION.

The objects of the *Caisses Populaires* which are embodied in the second article of the constitution of "*La Caisse Populaire de Levis*," are—

(1) to protect its members against reverses of fortune, the results of sickness and want, teach them the benefits of prudential measures based on mutual assistance and co-operation, and, in particular, by instilling and developing in them the taste for, and the constant and energetic practice of, economy;

(2) to aid them by a wise system of credit in the shape of loans and advances;

(3) to enable persons devoid of fortune, but who are honest and laborious, to form part of the association by granting them facilities for paying up their shares in the capital stock by means of very small weekly instalments;

(4) to secure the practice of the Christian and social virtues that mark the good citizen, the honest, laborious and honourable worker, by exacting, above all, moral guarantees of the highest order from the shareholders who borrow from the association;

(5) to combat usuary by means of co-operation, by providing credit to all who are deserving of it;

(6) to foster a spirit of enterprise and promote local works, whether of an industrial or agricultural character, by the prudent use of the savings effected within the district covered by the association's operations;

(7) to spread amongst its members a practical knowledge of the elementary principles of economic science;

(8) to teach them respect for their engagements, and also the advantages inevitably derived by those who faithfully fulfil the obligations they have undertaken;

(9) to create and foster mutual confidence

between shareholders by means of economic relations based on the security of guarantee of character ; and

(10) to gradually procure for them that economic independence which inspires and fosters the feeling of personal dignity, and convinces one of the need of relying above all upon oneself to improve one's position and raise oneself in the social scale.

ADMINISTRATION.

The administration of each association is carried on by three committees, *viz.*, the Council of Administration composed of five or nine members ; the Committee of Credit of three or four members ; and the Committee of Supervision consisting of three members.

The Council of Administration is chosen from among the shareholders. The Council chooses a president, a vice-president and a secretary who form the Executive Board and besides act as the president, vice-president and secretary respectively of the association.

They "take all the measures they deem advisable in the interest of the association not infringing upon the general by-laws or the State Law."

The Committee of Credit of the president and four shareholders appointed at the general meeting. They determine the credit which may be allowed to each member. If they refuse to grant a loan, the shareholder concerned may appeal to the Council of Administration. The members of this Committee should make themselves acquainted with the financial standing and moral character of every borrower, and none of them may borrow from the association or become surety for any loan made during one's term of office.

The Committee of Supervision, elected by the shareholders, forms a permanent board of supervision. They audit the accounts, pass general criticisms and watch over all the undertakings of the Society.

CAPITAL OF THE ASSOCIATIONS.

The capital of each association is variable and is raised by selling shares and by receiving deposits. The share capital is designed to furnish the more stable portion of the association's funds and the buying of shares is encouraged by a somewhat higher rate of interest than can be had in the ordinary savings bank. The shares, generally $5 each, may be paid in small weekly or monthly instalments, and according to these shares the profits are distributed. Application for membership must come before the Council of Administration for approval, and according to the constitution of the association, the applicant "must be honest, punctual in his payments, sober and of good habits, industrious and laborious." A member must be expelled if he becomes bankrupt or insolvent, or should he in any way violate the constitution or by-laws. The amount of stock which a member may hold is limited and each member has only one vote, no matter how much stock he holds. The liability of each shareholder is limited to the amount of stock he holds. Any person may withdraw from membership and receive back all the instalments which he has paid on his shares.

The members of an association may deposit their savings in amounts of not less than five cents, and on all deposits current savings-bank rates of interest are allowed. A school-children's savings department is also opened. Each member making a deposit is given a pass book in which each withdrawal or new deposit is entered as in ordinary banking.

The "Caisses Populaires" confine their business almost entirely to their own members. Loans and discounts are granted only to members, and from members alone are savings and other deposits received.

If a society requires more funds than it receives from its members it may contract for loans from outsiders. Reserve funds may be invested in sound business enterprises, and the working surplus of a society may be kept on deposit in a regular chartered bank. Apart from these three classes of transactions, the business of the association is strictly confined to the membership.

LOANS.

The granting of loans lies with the Committee of Credit. Loans may be granted on

the note or acknowledgment of the borrowing shareholders ; or the Committee may decide that the loan shall be guaranteed by one or two other solvent members.

In his application, the borrower must state the purpose for which he wishes the loan, and this purpose must conform with the aims of the association. The advantage and convenience of the borrower is carefully considered both as to the time and manner of repayment, and as to the rate of interest charged, the instalment plan of repayment being always encouraged when it is possible. The instalments may be placed on deposit and draw interest until enough has been accumulated to pay the debt in full ; or by special arrangement, the instalments may be applied directly in reducing the debt, interest being charged only on the unpaid portions for the time which elapses from the granting of the loan until such instalment is paid. It is considered a point of honour that the borrower lives strictly up to the terms of his agreement.

The aim of an association being to benefit the greatest possible number of members, a number of small loans to different persons are given the preference, all things being equal, over one large loan. A member in a position to use a large amount profitably can generally obtain it from a chartered bank, while the poorer member has probably no security which he can offer. The general meeting fixes annually the amount which may be loaned to any individual shareholder.

COST AND DISTRIBUTION OF PROFITS.

The running expenses of the associations are invariably light. The only official is the business manager, and he is paid according to the time he devotes to the work of the society. He is generally someone who can give time to the affairs of the bank without interfering too much with his regular occupation. Other expenses, such as printing lighting, heating, and occasional travelling expenses do not amount to a large sum. After payment of the general costs of operation comes the claim for interest on deposits of which the society has had the use.

Twenty per cent. of the net profits of each year, as well as ten cents on each share paid as an entrance fee, is put aside as a reserve fund. This is done each year until the fund reaches a maximum of double the amount distributed in profits on the paid-up stock of any year. The reserve fund is invested by the Council of Administration in such ways as are attended with a minimum of risk.

Each association has also a Provident Fund constituted by means of a ten per cent. assessment on the profits of each year until the fund attains a maximum of one half of the yearly profits distributed on the paid-up stock.

After all these claims have been met comes the distribution of dividends on the paid-up stock. Shares not paid up when the year began receive dividends in proportion to the time elapsed since the last instalment was paid.

Co-operation in Bihar and Orissa.

According to the Government's report on the working of the Co-operative Societies in Bihar and Orissa for the period, 1st April 1912 to the 31st March 1913, the number of such societies rose from 538 to 595 and the number of members from 27,621 to 30,673 ; while the working capital, excluding the value of grain, increased from Rs. 9,05,112 to Rs. 13,72,212, an increase of over $4\frac{1}{2}$ lakhs, of which nearly $1\frac{1}{2}$ lakhs represent the increased work done by the Central Banks.

The total amount of Government money invested in Co-operative Societies on March 31st, 1913 was Rs. 11,732 ; deposits and loans made by private investors amounted to Rs. 3,51,995 while members deposited Rs. 82,890 largely under the compulsion of their rules.

The Industrial World.

An Industrial Depot at Bangalore.

With a view to make the work of the Mysore artisans better known than at present and to afford them an opportunity to gradually adapt their productions to meet modern requirements, the Committee for Industries and Commerce made certain proposals for organizing an Industrial Depot The Government of Mysore have approved them and directed that the main office of the depot be located in a suitable building, centrally situated in the City, a branch depot being opened in the South Parade, Civil and Military Station.

Machinery in U. S. A.

One has to live in the U.S.A. in order to realise not only the vast scale on which her industries are now working, but also the degree to which machinery has displaced human labour, and the inventive genius displayed in the construction of that machinery. To such a pitch has this inventive genius been brought that there are firms in America whose sole business is to invent machinery according to requirements. The customer has only to describe the article he is making and the firm at once sets to work to invent machinery to enable him to cheapen the cost of production.

Plantain-ash.

It may possibly come as a surprise to the majority of our readers to learn that the ash of the leaves of the common plantain has been used from time immemorial for the manufacture of salt ; the ash is used by dyers as an alkaline mordant, while *dhobies* used it in place of soap. In fact, so ancient is this industry that there is an account of the preparation of salt from plantain leaves in Tavernier's *Travels*. Analyses of the ashes of several samples of plantain leaves obtained from various localities, show that the constituents differ largely in the several samples according to soil and locality.

The Preservation of Orange Juice.

An interesting account of investigations connected with the preservation of orange juice has been lately given by Messrs. H. D Gibbs and F. Agcaoli in the *Philippine Journal of Science*. The experiments extended over two years, so that ample time was given for the effect of the process employed to be ascertained. Sterilisation was effected either in tightly stoppered and wired bottles which were placed in a water-tank heated to 176° Fahr. for two hours, or else by filtering through Berkefeld filters and bottling in sterilised bottles without heating. In some cases quantities of sugar, varying from 5 to 15 per cent. were added. After long storage, in some cases over two years, the bottles were opened and the contents examined. The analyses showed that the sucrose was entirely inverted and the acidity in some cases slightly increased. The flavour was bitter ; pleasant to some and disagreeable to others. The samples containing 15 per cent. of sugar were much appreciated. It is stated that much of the bitterness can be obviated by methods of pressing which avoid as much as possible the crushing of the seeds and the segment covering.

Maize Sugar.

For the past three or four years sugar agronomists have had considerable worry, not to say, trouble, over the possibility of the "common or garden variety" of maize rivaling cane in the sugar market. The United States was one of the first countries to investigate this matter and apparently the first to turn it down. However, now that India and Rhodesia (South-Central Africa) have revived the interest in this very important subject, it behoves every one interested to experiment along this line.

The secret of the matter is, of course, known to the whole world, and there can never be

any patent process in it except in some minor detail of the methods of extraction. The fact is, according to all records of experiments at hand, the maize plant when deprived of the ears at about the time starch is being deposited in the kernels, *i.e*, when the seed is " in the milk," does develop a remarkable saccharose, or, rather, glucose, content. Sugar-cane is considered above the average if it analyzes 13 per cent. of sucrose ; it appears that the agricultural chemist of the Rhodesian Government finds as high as 12½ to 14 per cent. of sugar and about 1 per cent. of glucose in the decobbed maize stalks in his experiments ; some of the Indian experiments at Pusa indicate that as high as 9 per cent. of the weight of the maize stem may be turned into sucrose by the artificial upsetting of the normal physiological function of this crop which some experts believe will be, through its wonderful variability under the hybridizer's hands and its adaptation to man's various needs, the greatest crop of the future.

Hand *versus* Power-Loom Weaving.

Mr. Thomas Welsh writes to the *Textile American* that hand-loom weaving is never better for the cloth and seldom more expensive for the manufacturer. One might safely go even further than that and say that the power-loom does better work than the hand-loom. Better work, not in that the cloth will wear any better, for that is a matter of quality of material and construction of the cloth, but in that the cloth is more evenly woven from start to finish. The mechanical processes of weaving, shedding, picking and beating up are accomplished with more precision and with much greater regularity by the power-loom. The positive take-up motion and the very sensitive deferential let-off motions of the best power-loom secure that the piece shall be woven with the same number of picks and the same warp tension from beginning to end.

It is very different with the hand-loom. Every four or five inches the weaver must stop to let off his warp and to take up his cloth. It takes much practice and extreme care to prevent a mark at these stopping places, especially if there should be a contrast between warp and weft. There is no manner of doubt that for perfect weaving the power-loom, as now made, is greatly superior to the hand-loom.

As to the cost, on the one side is the higher wage of the hand-loom weaver ; on the other, the small capital expenditure, and the extremely low working expenses. The hand-loom does not require a substantial building ; it costs not more than £10 to start it, and it will remain in working order for many years with no charge for repairs except a few shillings for pickers and string. The weaver is himself the motive power, and while he does not make better work, he seldom has as many breakages as the power-loom weaver. The cost of mending a hand-loom woven piece is small. The power-loom weaver gets less money for weaving a piece, but the capital expenditure is much higher.

The power-loom must be placed in a more substantial building than its rival. It costs somewhere about £65 to start, and a considerable annual sum to keep it in running order. The single act of a careless weaver may cause as much expense as would keep a hand-loom running for years. To drive it there must be power, which costs £7 a year. In addition to the weaver there must be an overlooker, who costs 2/6 a week. A power-loom woven piece costs much more to mend than one woven in the hand-loom. Putting all these together, it seems pretty certain that the hand-loom does its work as cheaply as the power-loom.

Mr. Welsh concludes by saying that those who wish to prolong hand-loom weaving for the sake of the old folks, or for the picturesqueness of it, might easily spend their money in a worse cause.

Indian Sheep-skins.

Sheep-skins of Indian origin are recognised as possessing peculiar merits commonly ascribed to the fact that in many parts of this country the sheep is very closely related to the goat ; and in the opinion of some experts the introduction of strains more famous for the yield

of wool will tend to impair the characteristics of the pelt or skin. The importance of the trade to India may in part be gauged by the following figures which show the exports of raw and of dressed skins in recent years: —

Raw.

Unit 1,000—

	Cwt.	No.	Rs.
Average of previous three years . . .	566	25,045	3,86,26
1911-12	533	23,525	3,46,56
1912-13	555	24,146	3,67,14

Dressed.

Unit 1,000—

	Skins.		
	Cwt.	No.	Rs.
Average of previous three years . . .	142	17,902	2,78,11
1911-12	153	19,386	3,00,19
1912-13	130	17,204	2,55,76

The value of good methods in the preparation of these skins can therefore be imagined and we know that in recent years individual effort here and there has effected great improvements and that the local example has been in certain cases widely followed. But many of the merchants most directly concerned in the improvement of method have no technical knowledge of the processes required or of the principles underlying them; and the literature on the subject has hitherto been so meagre as to afford no adequate guidance to persons who desired to ameliorate conditions. A book called *The Sheep and its Skin*, by Alfred Seymour-Jones (London: *The Leather Trades Review*, 13*s.* 5*d.* with postage) goes far to supply the want. The first half of the book is devoted to matters relating to the sheep as a living animal and as a source of valuable products. The second part (from Chapter VIII onwards) deals more specifically with the matters that affect the preparation and conservation of the skins. The author contends that the operations performed during the stages of the wet-work may be carried out by means of physico-chemical reactions as well as by the aid of bacterial action In his later chapters he explains the practice to be adopted, and in an appendix he reprints, by permission, a paper by Mr. J. T. Wood which bears very clearly on the subject. The book is one that would be useful to any one who is largely interested in the Indian skin trade.—I.T.J.

Cocoanut Butter.

According to the United States Consul at Carlsbad (Austria), most of the Cocoanut butter manufactured in Bohemia is made of Cochin-China or Indian copra, which is received in large wooden tuns. The dried copra is sliced, and the fat is extracted by oil presses, quite a simple process. This raw oil contains soap fats and does not have a pleasant odour. It is placed in large tanks and the first step in the refining process is the addition of powdered chalk, which absorbs the soap fats and settles to the bottom of the tank. The oil on the surface is pumped into another tank, passing through four or five filters as the second step in the refining process. It is then forced into a tank heated by steam pipes to about 270 518° F. This process continues until the oil is as clear as crystal and begins to bubble. It is then pumped into an automatic weighing apparatus and run into the moulds, where it is allowed to cool. The tablets or cubes are removed to the packing table. Part of the oil is run into various sized tubes and is also placed on the market in this form. The soap fats, combined with the chalk, are treated with sulphuric acid, which dissolves the chalk, leaving the fats floating on the surface of the solution. These are drawn off into tubes and are sold to manufacturers of soap. The trimmings of the copra slices are made into a powder, which commands a good price as fodder for cattle and pigs. The cocoanut fat is white, but when manufactured into butter is coloured to resemble oleomargarine. Sesame oil is added to make the product more pliant. Coco butter keeps well either raw or refined and does not spoil for months, even in warm weather. It is claimed that the ordinary consumer cannot detect the difference between this butter and oleomargarine. Six or seven years ago the output of cocoanut butter in

Austria was about 40 tons a day. It is now approximately 300 tons. The price has increased from $18·25 to $26·40 for 200 pounds. The factories claim they cannot keep up with the demand. The market is controlled practically by two firms, one in Vienna and the other in Aussig.

Fallacies regarding Indian Industrial Improvement.

Presiding over a lecture on "Industries and Self-Government" delivered in Madras by Mrs. Annie Besant some time ago, Dewan Bahadur M. Audinarayaniah made the observation, among others that three fallacies are at present abroad, as regards the scientific and technical education of the people and the general industrial improvement of India. One is that higher technical and scientific education need not be given, so long as the industries themselves have not come into existence or have not adequately developed. The familiar argument in support of this idea is that the creation of men so educated may give rise to discontent among them, when they find there is no employment available for them. It is, however, lost sight of that the industries themselves can never have any indigenous growth unless the people are fitted for it by education. All industrial enterprises require for their success three factors: Capital, Character and Capacity. The last two cannot be acquired without a proper system of education, and without them capital can never be induced to move out of its hiding place. How are we, asked the speaker, to search for and utilise the resources around us, if we are not equipped with knowledge? The Government of India recently started some enquires to ascertain what scope there was for the employment of Indian talent which may be trained in higher technology and scientific knowledge. The result of this enquiry was that the existing scope is very limited. There is also a disinclination on the part of European-managed enterprise to employ Indian talent, on the curious ground that Indians will be found incapable of managing large bodies of workmen. That this objection is an untenable one is shown from the history of the large number of Bombay Cotton Mills. But the point that he wanted to make out was that unless indigenous enterprises came into existence and are fostered, there will never be any adequate scope for indigenous talent, and in order that such industries may come into existence, a liberal system of technical and scientific education is necessary and should be inaugurated.

The second fallacy is that the State should not undertake the pioneering of industries in the country. This he believed was the dictum laid down in a despatch of the late Secretary of State, Lord Morley, and apparently this is based on the ground of the impropriety of diverting the funds contributed by the general tax-payer to the benefit of particular classes. He thought that in this decision the broader view of promoting the general efficiency and prosperity of the people as a whole was lost sight of.

The third fallacy referred to the indiscriminating demand made for the introduction of a Protective Tariff in India. He did not understand what advantages are expected from such a course in the present state of the country. Excepting the cotton mill and jute mill industries and the recently started great Tata Iron and Steel Works, there are no large industries worth speaking of. By far the greater part of the export trade of India is in raw produce, most of it going to countries other than England. The imports which are mainly manufactured goods, come for the most part from England. India does not enjoy fiscal independence and cannot expect to institute a Protective Tariff against England, while protection against foreign countries might involve her in trouble and jeopardise her large export trade with them in her raw produce. For, except, as regards jute, and perhaps a few other articles, such as tea, and some oil seeds, India does not enjoy the monopoly of production so as to be able to retaliate against them.

Manufacture of Brushware.

The process of manufacturing brushware

may, with advantage, be divided into three sections or departments :—(a) The preparation of the bristles, hair, bass, istle, kitool, piassava, whisk, and a great variety of other materials which form the brushing elements of the brushes and which must be carefully sorted, dressed, and made ready. (b) The making, shaping, planing, boring and preparation of the brush-stocks or backs. (c) The insertion into the holes in these stocks and the careful securing or anchoring therein of the brushing elements, likewise the trimming, polishing and finishing of the brushes. A description of the first stage in the manufacture is given in a recent issue of the *British Trade Journal.*

PREPARATION OF MATERIALS.

In some countries where the manufacture of brushes is very extensively carried on, the trade on the brushing elements has become divided into two distinct branches, that is to say, there are firms which undertake the importation and the treatment and preparation of the bristles, hair, fibre, whalebone, etc., which they supply to the brush-makers in bundles prepared and ready for the brush-making machines. This simplifies to a certain extent the work of the brush-maker, and relieves him of the care and supervision of this department, which may be a great convenience, especially to firms in a moderate way of business. In extensive brush factories it is generally considered most advantageous, especially from the financial point of view, to buy the brush-making materials direct, and to prepare them on their own premises, which enables them also to utilise any special machines and processes they may have acquired.

The preparation of the bristles and the hair, ready for the manufacturing stage, involves a variety of treatment dependent on the nature of the materials and on the condition in which they are received. The bristles, if in the raw state, must be cleaned and freed from all extraneous matters by suitable machinery and processes. These, in consequence of their great variety, it is not possible to describe and illustrate.

SORTING AND COMBING.

All the prepared bristles and hair then pass through sorting and combing processes. Bristles and hair are used in brushware according to their lengths, their degree of stiffness and their colours (black, yellow, grey, white, etc.). They need therefore to be sorted with great care into their various qualities and colours. For this purpose, hand-labour is usually employed, and the work is of such a nature that there does not seem any probability of machines being invented to automatically distinguish and sort out the different colours and the different degrees of stiffness. The bristles and hair must also undergo a sorting into their various lengths, and this can be effected automatically by the automatic sorting and drawing machines for bristles and hair.

This machine is, in its present construction, perfectly well adapted for sorting and drawing out bristles and hair varying in length from $2\frac{1}{2}$ inches to $6\frac{1}{2}$ inches.

The bundles of bristles and hair, as received at the brush factories, contain a considerable percentage of "shorts" (say) up to about 2 inches, which cannot be advantageously utilised in the brush trade; consequently, the longer bristles and hair must be drawn out of the bulk. This the machine accomplishes, but it does much more, by simultaneously sorting the bristles and hair according to their respective lengths and depositing them carefully on the iron trays, each one of which is devoted to one special length. The range of the machine is from $2\frac{1}{2}$ inches to $6\frac{1}{2}$ inches, and the classification of the different lengths can be by $\frac{1}{4}$ inch from size to size, or even $\frac{1}{8}$ inch, according to the setting of the machine. The machine is automatic in its action and needs one woman to attend to it, for the purpose of feeding in the materials to be treated, and removing the sorted and classified materials. The production of the machine is about 150 lb. in ten hours, according to the quality of the material used. The power required is half-horse. The machine is finding general acceptance amongst brush-makers, in consequence of its practical, labour-saving work.

Bristle-Rolling and Rubbing.

Another important machine is the bristle-rolling and rubbing machine. Bristles for bru h-making purposes need to be freed from their roots and their tips. This machine performs the operation efficiently, without damaging the bristles or deteriorating their brush-values. The treatment which they undergo in passing through the machine by being rolled and rubbed detaches the roots and the tips of the bristles in such a manner that on leaving the machine all the roots are to be found on one side and the tips on the other side of the machine.

One girl suffices to feed the machine and to remove the treated bristles. The production is about 100 lb. in ten hours.

Hackling, Cleaning, Drying, etc.

The preparation of the many varieties of the fibrous elements for the brushes involves the use of various processes according to their quality and condition. In some cases, the fibre usually arrives at the brush factory in fairly clean and good condition, and requires little treatment beyond cutting off the over-long tails and then hackling by hand labour—that is, passing the fibres through the steel teeth of hackles or combs, in order to dress and free them from each other, and to comb out the waste. These hackles are of various degrees of fineness, and the operation of hackling is easily learnt, involving, as it does, more care than skill. In other cases, the fibrous elements need a considerable amount of treatment in order to clean them and free them from extraneous matters. This treatment varies very much in accordance with their nature and condition. They may have to pass through willowing, boiling, washing, and drying processes, involving the use of apparatus as well as machinery. Special machines are also being advantageously used in the treatment of some special fibrous elements. In some works the fibres also undergo a dyeing process, in order to produce colours which are not natural to them, and a special process is also used for imparting to some of the fibres a bristle-like appearance and quality. All these fibrous elements undergo the same hackling process as mentioned above, in order to become suitable for brush-filling.

Uses of Paper.

The *Scientific American* writes :—It is a question whether there is an industry in this country more interesting than the manufacture of wood pulp and its many uses. A number of countries have contended for the honour of enjoying greatest progress in the making of various articles from wood pulp. Germany, France, England, and the United States are the principal claimants. Of the four countries named, Germany would seem to have the balance of testimony on its side. Novelties made from paper pulp are by no means of rare occurrence in the United States, and are now so multifarious as to defy enumeration.

At first, wood pulp was used entirely in making paper, but to-day it is employed for manifold purposes. Its use bids fair to be large for moldings, friction clutches, belt pulleys, gear wheels, barrels (reinforced with wire), tubs, pails, washboards, water pipes, conduits, caskets, bath tubs, carriage bodies, floor covering, electric insulators, umbrella stands, furniture, imitation of leather, cloth and silk. Clearly the employment of wood pulp is practically unlimited.

The great consumers of wood pulp to-day are the paper manufacturers who use nearly 90 per cent. of the entire production.

By proper treatment wood pulp can be made perfectly translucent, unbreakable, and indifferent to atmospheric changes. While it has not yet been made transparent, it admits abundant, soft, pleasant light, where it is used in place of window panes. Paper pulp is now made up into boards that can be used in a variety of places to supplant the use of wood. The ease of molding into any desired shape and the saving in weight make the use of this product valuable in construction of the ornamentation of ships such as the facing and frames of doors, wainscotings, panels, etc. This material is also used in making imitation

tiling for the walls of bath rooms, the forming of closet seats, etc. In fact, entire houses, garages, hen-coops, etc., have successfully been made of this paper board. When properly impregnated it is impervious to moisture and forms a good non conductor of heat. Another product used in house construction is roofing tiles, which are now gaining a reputation for their superior qualities over other roofing material in the market. The application of wood pulp for house-building is not new, and has met with complete success. In Europe there are some firms which build houses almost entirely of water-proofed pasteboard. Wood pulp is likewise used instead of wood for making furniture, tables and folding chairs, their chief advantages being lightness.

Paper screws are now being made which give thorough satisfaction. The principle of having wood against wood is a point in favour of wood screws. They are used for ornamental work, where it is desirable to give the heads of the screws the same colour and grain effect as wood. A varnish on top of this adds to the effect and protects the dye, as it penetrates the fibre and acts as a preservative. It has been estimated that these wood pulp screws can be made so cheaply as to compete successfully with screws and log bolts of other types. Paper screws can be readily removed even after they have been in place for many years. The screws are cast and the thread is cut as in the common wood screws. The drive screw is cast with attenuated thread curves, so that when driven it revolves and finds a firm footing in the wood. It can be driven only into soft wood after a hole is first started.

Another economic application of paper which is gaining in importance is the making of cord and rope. These new ropes are spun and twisted out of the thin threads which are made from wood pulp. This industry has attained considerable importance in Europe. It is said that these ligneous fibre ropes are used more or less extensively in the foundries of Germany. The fine threads which make up these ropes are made by forcing the chemically treated wood pulp or cellulose through very fine tubes into running water, in which they harden. After they are dry they are perfectly pliable and somewhat elastic, and may be spun or twisted into any form whatsoever. These minute, elongated threads are caught up as they are forced through the fine tubes and spun into ordinary silken threads, which are woven into a fabric resembling silk.

A French inventor discovered that paper may be cut into narrow strips several millimeters wide and that after these have been steeped in certain chemicals which give them tenacity and ductility, they may be rolled and twisted into threads, which may be worked up into fabrics of various kinds and put to a great variety of uses Another French chemist has discovered a way to make such fabrics, as well as ordinary paper, waterproof, and a German inventor has produced a good quality of thin paper practically fireproof.

Such discoveries have led to the making of hats, raincoats, corsets, vests, underwear, collars, ties, socks, shoes and even overshoes. In the Chicago City Hospital, experiments have been made in furnishing the patients with garments made of a soft tough paper. These garments are light and airy. After use each garment is destroyed and thus all danger of infection is avoided. The paper raincoat is a novelty. It is made of a light-weight water-proof paper. The garment comes folded in a very small package which can easily be put into a lady's handbag. The package is opened and the coat unfolded as occasion demands. The article is so cheap that it can be thrown away after use. One inventor has designed a paper sock for use in the army. The sock covers only the parts of the foot that are usually chafed by the shoe. This insures light weight and adds greatly to the comfort of the wearer.

Paper may even be so treated as to make it suitable for sails for light vessels. Such sails are not woven from strands or threads, but are made up from compressed sheets of paper, which are made in the regular way, the pulp having been thoroughly mixed with certain chemicals and other substances: These paper

sails are inexpensive compared with good canvas stock or rubber material.

But by far the greatest progress has been made in the application of this material to sanitary and domestic uses. The realization by the public generally of the germ theory of disease has done more to multiply the uses of paper than any other factor. It has led to the introduction of various individual receptacles and containers that now appear upon the market. Notable among these is the individual drinking cup. The extent to which these cups are utilized can be comprehended when it is stated that the returns realized from the sale of penny cups from slot machines in the Pennsylvania State capital building alone amounted to $113 during the past year.

In modern sanitation and the treatment of diseases the various paper receptacles and protective appliances have proven of inestimable value. In some of the Western States, notably California and Colorado, which furnish a climate especially beneficial in the treatment of tuberculosis, it has become imperative for all public articles to be thoroughly protected. Otherwise contagious diseases will be spread instead of checked. Some of the most dangerous articles are the telephone mouthpiece, the common towel, and the public drinking cup. Paper has come to the rescue and supplied towels and drinking cups that are to be discarded after use.

Milk bottle of paper will soon be in extensive use. They are cheap and sanitary and the troublesome washing and collection of the empty bottles is obviated. The danger of breakage is also eliminated. A very recent improvement in paper milk bottles appears in a patent to A. G. Brant (No. 1,067,237). This is a bottle having a narrow strip of transparent material running the full length of the side. This allows the buyer to see the level of the cream on the milk or the level of the liquid in the interior, and enables him to tell whether there is any sediment in the bottom of the bottle.

Paper receptacles of all kinds are now on the market. These are especially valuable in the packing and shipping of foodstuffs. The manufacture of water-and grease-proof paper has recently been introduced and is especially useful in this connection. Eggs are best packed in paper receptacles, and a recent practice has arisen of shipping eggs by parcels post in a special type of paper container. Ice cream is at present sold in small quantities, packed in paper receptacles, and it has become a practice for some of the progressive dealers to furnish therewith cheap paper spoons that cost very little.

The packing of loaves of bread in individual wrappers is another advance in the handling of foodstuffs, an advance which not only insures cleanliness, but also prevents the entry and escape of moisture and preserves the freshness of the loaf.

One inventor, J. W. Weiss (No. 1,063,845), makes a collapsible box of paper with a reinforced part along the sides or corners. Usually collapsible paper boxes are very flimsy, but this box is strong enough to bear the weight of a full-grown man. The immensity of the paper box industry may be realized when it is stated that in one industry alone—the manufacture of pens, pencils and erasers—over four thousand different sizes and shapes of boxes are required.

But the use of paper in this country cannot approach the many uses to which it is put in Japan, which is virtually a paper kingdom. The houses are made of thin, light frames of bamboo covered with paper. Almost everything that the Americans make of wood or leather is there made of paper. The coolies wear mantles in rainy or snowy weather made of a very tough grade of waterproof paper. These mantles can be used continually for about a year and cost only 18 cents. The tea merchants use paper sacks, the paper having been tanned by a vegetable acid. These sacks are used over and over again, and it is said to be a common thing to see sacks that are eight or ten years old and have paper patches on them.

The Commercial World.

Business Enterprise in India.

The business enterprise of India during the month of September may be seen from the following abstract of Companies registered in that month.

		Rs.
6	Banking Companies ...	31,20,000
2	Insurance Companies ...	1,20,000
1	Railway Company ...	85,00,000
2	Printers and Publishers ...	2,30,000
7	Trading Companies (other than specified above) ..	23,70,000
2	Mills and Presses ...	4,50,000
1	Tea Company ...	2,00,000
2	Mining and Quarrying Company ..	22,50 000
1	Land and Building Company ..	6,00,000
2	Sugar Manufacturing Companies ...	4,50,000
1	Company (other than those specified above) ...	
27	Grand Total ...	1,82,90,000

The Opportunity in India.

Mr. Louis Coffin, the export manager of the U. S. Playing Card Co., Cincinnati, writes in the *Export American Industries.*

" Most of us realize vaguely that India is a very large market, but very few of us, I think, have any practical conception of the enormous extent to which it can absorb goods if it once takes to them. Why, Bombay and Madras alone, if they get to like your article, are simply bottomless pits and you seem to be able to pour supplies into them in an endless stream, so that you wonder where on earth they all go to. Then Karachi, Calcutta and Rangoon across the bay are not by any means little buyers. We manufacture a small article in very general use and the goods we send to India retail for about ten cents apiece over there—one of them lasting the consumer indefinitely ; yet we are to-day nearly nine months behind in filling orders for our Indian trade. Of course this sort of thing can only be done with an article in general use by the natives, but if you have something of this kind and can once get it firmly established over there, there does not seem to be any limit to the quantity our dark-skinned friends will take."

" Dark-skinned friends " may not be a very palatable description of would-be customers, but the writer tells his American merchants that America has secured good custom in China anyhow, which only, "a dynamite or American ingenuity can shake." Moreover, " the native Indian, except for his natural conservatism, is not ill-disposed towards your goods—rather the reverse. Rightly or wrongly, there is, and in this I believe old Indian travellers will bear me out, a certain subdued resentment against England and things English, which is increasing with the spread of education and is perhaps only natural (whether unreasonable or not is another question which I won't discuss) in the people of any subject nation, towards the country which rules them.

Then why not, Americans, take the opportunity at the flood ?

" If you have a London office, detail the best man you have from there ; if not, send one over, and see that he is a good specimen, to look up the merchants right in London, doing business with India. If he can convince them that his goods are right, his price reasonable and his terms fair to them, you will be surprised at the business you will get, particularly if he does not tie himself down to any one firm and if you help him along with a vigorous advertising campaign in whatever ways suits your article best. This last does not necessarily imply a heavy expenditure, either. If you can use British-Indian trade journals to advantage you will be surprised at the reasonableness of their prices and the results they produce."

How many commercial houses in America know the opprtunity or having known it, take it !

The Proposed Commercial Congress.

It is proposed to organize an Indian Commercial Congress. Mr. J. K. Mehta of 77-79 Apollo Street, Bombay, is the Secretary of the Organising Committee and Sir Fazulbhoy Currimbhoy is supporting the movement. The main points of draft constitution are as follow:—

The Indian Commercial Congress is founded for the purpose of promoting by all legitimate and constitutional methods the best interests of trade, commerce and manufactures of the country and all cognate matters connected therewith.

For the fulfilment of these objects, the Congress will hold its session from time to time as occasion may demand, but at least once in every three years, at such place and at such date as may be determined, discuss all mercantile and industrial affairs, prepare and submit representations thereon to the Provincial Governments, or the Government of India or the Secretary of State or the British Parliament or other authorities for the removal and prevention of injurious commercial measures and the introduction of others which may be calculated to promote the general commercial and other cognate interests of the country, and otherwise take such action as may be conducive to the accomplishment of the object in view.

The Indian Commercial Congress shall consist of delegates elected by different commercial bodies in the country in the manner hereinafter prescribed. The delegates in the Congress assembled shall from among themselves elect a Committee of Management to consist of delegates from Bombay, Bengal, Madras, Karachi, Rangoon, Cawnpore, Delhi, Lahore, Amritsar, Nagpur and such other cities which may hereafter be resolved upon by the Congress.

For the purpose of the election of delegates there shall be formed in each of the following Presidencies and Provinces, namely, Bombay, Bengal, Madras, Behar and Orissa, United Provinces, Punjab and Central Provinces electorates of recognised and well-known public bodies, such as Chambers of Commerce, Leagues, Associations and so forth, of standing interested in Indian commerce & manufactures.

Marketing of Fruit.

In the *Journal* of the Irish Department of Agriculture for October 1913 there is published an instructive article on the above subject with reference to the gathering, grading, packing, wrapping and marking of apples, strawberries, raspberries, currants, gooseberries, plums and cherries, etc., intended for the market. Some general principles ought to be observed in the process of sending fruits to the markets. The article, under notice, has taken up the apple fruit, for the extensive application of these principles. " The profits of apple culture," as of any fruit cultivation, we may add, " depend largely upon the fruit being carefully gathered and stored, honestly graded, and well packed in suitable packages, which should be of known standard capacities." The present methods of fruit trade in India admit of vast improvement in many directions and references have been made to them from time to time in the "*Wealth of India*" in pages 623 and 766 of this year. It will be well to bear in mind the observations given below.

" A clean, neat, new package," we read, " helps the sale of its contents, and its cost is usually more than recovered in the extra price obtained." Packers of Irish apples are advised to use barrels and boxes of fixed standard sizes, for the following reasons:—

(1) Buyers will know exactly what quantity of fruit the package contains: a package of known capacity can always be sold more readily than one of unknown and varying capacity.

(2) Makers of boxes and barrels will know exactly what is required, and will therefore be in a position to supply them more rapidly and cheaply than would otherwise be the case.

As to grading, the following conditions are to be strictly observed :—

Select Grade.—Fruit must be well grown; shape normal; practically free from blemish, injury, or disease; skin unbroken; no decay.

First Grade.—Fruit must be well grown; shape normal; skin unbroken; slight surface

wounds permissible if skin has healed over same ; surface blemishes from scrab, spot, or other insect or fungoid pests, or from decay, must not cover a total surface area exceeding the area of a sixpence.

Second Grade.—Fruit may be slightly deformed ; surface blemishes from scrab, spot, or other insect or fungoid pests or from decay, must not cover a total surface area exceed ing the area of a shilling ; slight surface wounds permissible.

Whatever system of packing is adopted, if fruit is to be marketed in good condition and packed so as to present a taking appearance, it must be carefully graded, and handled with great care so as to avoid injury by bruising.

The wrapping and other things vary accord ing to the fruit to be treated, climatic conditions and the transport facilities obtainable.

All packages should be labelled, and correctly and fully invoiced,and consignees should be advised that shortage in weights invoiced must be notified immediately on receipt.

General Rice Warehouses in Japan.

The idea of building large warehouses capable of holding produce and so constructed as to ensure the safety of the deposits they hold is not new in Japan. The modern *beiken-soko* or general rice warehouses, are only a special type of the *futsu-soko* or ordinary warehouses. They receive from agriculturists and tradesmen fixed quantities of dry goods of which they assume direct care. The institution is of interest to us in India in which agriculture is the main industry and no apology is needed for dealing with the subject at some length. The principal operations conducted by the "beiken soko" may be grouped as follows :—

(1) Care of crops.

(2) Issue of *warrants* for deposited crops ;

(3) Granting of loans guaranteed by deposits ;

(4) Improvement in the type of sack to be used in the warehouses with a view to facilitating preservation and despatch ;

(5) Promoting improvements in the production of cereals ;

(6) Exercising strict control over markets ;

(7) Taking charge of eventual forwarding and conveyance ;

(8) Acting as intermediaries in questions relating to the insurance of deposits ;

(9) Organising exhibitions and shows, promoting the use of fertilizers, of machines and agricultural implements.

The principal advantages which cultivators and rice-merchants derive from the working of these warehouses, may be stated as follows :—

(1) The complete safety of the warehouses, due not only to the fact that through a superior supervision and a better organisation than is possible in private warehouses the liability to damage is lessened, but also to the possibility of insuring all deposited cereals at low rates against fire, theft, infiltration of water, etc.

(2) The institution of beiken-soko makes private warehouses unnecessary, a circumstance which, in addition to leading to the advantages already enumerated, results in a great economy in storage with all its attendant expense.

(3) It offers both to the producer and the dealer great advantages in the marketing of cereals, not only because beiken-soko effectively eliminate the charges of intermediaries and enable the cultivator to realize higher prices, but also because the warrant, being immediately negotiable, affords its holder the opportunity of profiting by favourable market conditions for the final disposal of its goods. Beiken-soko are able in addition to guarantee an honest grading of the cereals, as their examination is not influenced by any speculative object. Moreover, they render all further examination of the goods in case of sale, quite superfluous, and the warrants, by facilitating all operations of buying and selling, aid in a great measure in the extension of rice markets.

Notwithstanding these many advantages, there are a few drawbacks—

(1) The relative ease with which the warants may be used irregularly, or even forged ;

(2) The limited extent to which small cultivators can make use of the warehouses ;

(3) The facilities which the warehouses may

afford to operators attempting to effect "corners" in cereals.

It is, however, interesting to observe that these disadvantages are almost insignificant compared with the great utility of the beiken-soko, which fact is made obvious by examining the results obtained.

Although the constitution and working of the various warehouses keep to general lines, their details vary according to locality. In the Prefecture of Kumamoto, according to the inquiry of 1910, there were 21 general rice warehouses. Most of which were co operative in form. The most important are the Central General Warehouse and the General Warehouse of Yokojima.

To complete this brief account of the development of general rice warehouses in the two provinces of the Japanese Empire where these institutions are especially thriving, we shall add the more important data regarding the business transacted by warehouses in the province of Kumamoto between November 1st, 1909, and October 31st, 1910.

(*a*) *Deposits*—

Made by peasants (not proprietors)—	bags	77,079
" " proprietors ...	"	31,684
" " dealers	"	229,264
" " other persons ...	"	70,006
Total ...	"	408,033

(*b*) *Withdrawals*—

Number of transactions ...		4,314
Number of bags withdrawn ...		395,270

(*c*) *Advances made drectly by the warehouses*—

Number of advances made ...		643
Average period for which advancs were made ...	days	56
Sums advanced: to farmers ...	yen.	24,353
Sums advanced: to proprietors...	"	33,387
Sums advanced: to dealers ...	"	84,565
Total advances made directly by the warehouses ..		142,305
(*d*) *Advances made by other agencies* ...	yen.	1,074,400
(*e*) *Total payments for insurance*	"	1,023,200
(*f*) *Compensation paid by the warehouses for sundry damage (depreciation in deposit, theft, etc.*	"	52,252

India's Worth to England.

How much England owes to India is well told by Edward E. Long in the October number of the *Empire Review*. It is refreshing to hear him, especially at a time when we hear a great deal talked about the need of England to India, so as to really overshadow the other view—that of India to England. Passing from the general political aspect, "it will be recognised," says Mr. Long, "that the very existence of our present highly-favoured and extremely profitable commercial dealings with India depends upon the maintenance of British rule in India as the paramount power."

Analysing those commercial dealings, India offers the best market for England's manufactures, a good producing-ground for the supply of raw material, food and other products and a vast field for the investment of England's savings.

"As a market for British manufacturers, India is far and away the best the British manufacturer possesses. Not only does she take more imports from the United Kingdom than the whole of the colonies put together, but the United Kingdom sends more exports to India than to any other country in the world."

The bulk of India's exports, consisting of jute, hides, wool, cotton and oil seeds enter England and India possesses practically a monopoly of raw jute and lac in the matter of their export to England. As for food and other products, there are wheat, sugar, tea, coffee, tobacco, rubber and rice.

Large amounts of English capital lie invested in the exploitation of India's mineral resources. "The Kolar Gold-fields," says Mr. Long, "can claim the reputation of being one of the best worked and up-to-date gold-fields in the world." India's mineral deposits are large and scattered and offer another field for the capitalist to invest his resources. An enormous amount of English capital has been invested in Indian Railways. A large sum of English money yielding a safe and good return is locked up in loans of various kinds, for

works connected with the development of the country.

This in itself is sufficient to justify the view, namely, that of the need of India to England, without taking into account the political advantages that Britain derives by possessing the Indian Empire.

The Changing Character of British Trade.

The recent wave of commercial prosperity has enriched England, as, indeed, all the world ; but England enjoyed a boom, perhaps, not comparable in magnitude to that which followed the conclusion of the Franco-German War forty years ago. The signs of a tide that is on the turn are now visible, and " no doubt in accordance with natural laws, we mus soon look for a change in conditions." This quotation is from a writer in a recent number of the *Financial Review of Reviews*, whose interesting conclusions are worthy of a little close study.

He gives an idea of the upward movement of British trade from very ponderous statistics, but as a check against over enthusiasm adds that, " however flattering it may be to us to know that in forty years we have multiplied our gross imports and exports by two, we cannot avoid the uneasy suspicion that on this occasion, at all events, figures tell an over flattering tale." It is enough to mention the pheno-

Years.	Value of the Exports (Domestic Produce) to each Group-Destination, *viz.*:—			Total Exports (Domestic Produce).	Proportion of Total Exports sent to each Group-Destination.		
	Principal Protected Foreign Countries.	British Colonies and Possessions.	All other Destinations.		Principal Protected Foreign Countries.	British Colonies and Possessions.	All other Destinations.
	Million £'s.	*Million £'s.*	*Million £'s.*	*Million £'s.*	*Per cent.*	*Per cent.*	*Per cent.*
1880 ...	81·9	67·6	47·4	196·9	41·6	34·3	24·1
1885 ...	71·2	71·3	43·6	186·1	38·3	38·3	23·4
1890 ...	86·6	78·3	60·5	225·4	38·4	34·7	26·9
1895 ...	74·7	62·3	55·1	192·1	38·9	32·4	28·7
1900 ...	79·9	81·1	58·7	219·7	36·4	36·9	26·7
1901 ...	67·0	90·4	56·7	214·1	31·3	42·2	26·5
1902 ...	70·9	93·7	56·4	221·0	32·1	42·4	25·5
1903 ...	72·7	96·8	60·3	229·8	31·6	42·1	26·3
1904 ...	71·8	97·2	69·6	238·6	30·1	40·7	29·2
1905 ...	80·1	99·2	83·9	263·2	30·4	37·7	31·9
1906 ..	93·5	106·8	96·1	296·4	31·6	36·0	32·4
1907 ...	107·6	120·8	103·0	331·4	32·5	36·4	31·1
1908 ...	89·6	109·7	86·7	286·0	31·3	38·4	30·3
1909 ...	93·9	111·0	86·0	290·9	32·3	38·1	29·6
1910 ...	105·0	129·3	99·8	334·1	31·4	38·7	29·9
1911 ...	107·5	138·7	110·4	356·6	30·1	38·9	31·0

menal emigration of the past few years to dispel any illusions on the subject.

"To arrive at a true understanding of the nation's commercial position, it is necessary to take a long view, and, what is more, a close view. The trade of the country which most counts in this connection is that which concerns the exports of manufactures of the United Kingdom. An illuminating Parliamentary return shows the value of exports of domestic produce to the principal protected countries and British possessions abroad, over a period of thirty-one years. Premising that the principal protected countries are Russia, Germany, Holland, Belgium, France, Spain, Portugal, Italy, Austria-Hungary, the United States, and Switzerland, we quote from the paper the above interesting table.

It will be seen that while in 1880 the percentages of exports were for Principal Protected Countries 41·6, for British Colonies and Possessions 34·3, and for "all other destinations" 24·1, in 1911, the respective percentages were 30·1, 38·9, and 31·0. Actually, in the case of Protected Countries there was in the thirty-one years an increase of 26 millions on an export of 80 millions, as contrasted with an increase of 71 millions on an export of 67 millions to British Possessions, and an increase of 63 millions on an export of 47 millions to "all other destinations." One does not require to be a fiscal expert to read into these figures, even as they stand, that the British export trade is more and more becoming a family matter.

"What has saved our trade from a condition approaching stagnation has been on the one hand our Imperial position and on the other our command, largely through that Imperial position of neutral markets, more particularly those in the Far East and South America. Not the least promising part of the Imperial field is that occupied by the Crown Colonies."

These figures illustrate the growth of the trade of the United Kingdom with the more important of the Crown Colonies :

EXPORTS OF UNITED KINGDOM PRODUCE TO PRINCIPAL CROWN COLONIES.

	1881.	1886.	1891.	1896.	1901.	1906.	1911.
	£	£	£	£	£	£	£
West India Islands and Guiana ...	2,900,400	2,550,112	3,345,005	3,118,685	2,969,951	3,356,716	4,152,921
British Honduras	114,418	91,034	136,849	100,607	78,039	111,623	127,318
Straits Settlements	2,743,518	2,262,654	2,589,262	2,073,001	3,282,728	3,859,489	4,503,743
Federated Malay States	...	...	...	...	...	174,407	635,677
Ceylon	849,499	606,349	1,061,374	1,052,898	1,594,544	1,662,092	2,629,723
Hong-Kong	3,800,189	2,564,709	2,732,157	1,959,209	2,797,978	3,220,498	2,985,812
Mauritius	481,773	292,297	276,795	327,006	1,028,698	424,145	580,962
Niger Protectorate	...	...	674,897	607,229	1,302,241	1,719,926	3,321,614
The Gold Coast (including Lagos).	394,524	435,321	746,153	1,064,014	999,484	1,028,258	1,783,103
Sierra Leone and Gambia	317,711	422,760	437,979	381,934	414,774	407,960	784,083
East Africa	...	...	...	...	174,822	571,796	749,485
	11,602 032	9,225,236	12,000,471	10,694,583	14,643,259	16,536,910	22,254,441

These are remarkable figures.

"Splendid as these results are, they probably only represent the beginnings of a trade movement which is distined to have an important influence on the prosperity of the United Kingdom."

In association with the figures given above in regard to the Crown Colonies, it may be of interest to take a little wider range and see how the country is faring in the regions which have long been looked upon as leading markets for British goods. Below will be found returns for seven centres which come within this category :—

EXPOTS OF UNITED KINGDOM TO—

	1881.	1886.	1891.	1896.	1901.	1906.	1911.
	£	£	£	£	£	£	£
British India	31,052,963	32,574,318	32,549,207	30,841,551	35,746,399	46,410,498	53,869,328
Australasia	23,982,404	25,017,882	28,256,120	24,354,816	29,581,892	30,833,759	45,139,976
Canada	8,783,703	9,046,592*	8,299,942*	6,695,820*	9,250,526	15,477,260	22,725,581
China	6,234,003	5,415,544	6,525,662	6,860,896	6,827,546	12,306,188	12,257,197
Japan	3,152,261	2,319,719	3,060,893	6,160,197	8,209,452	13,115,330	12,132,652
United States	36,783,047	37,607,805	41,066,147	32,035,784	37,651,150	53,240,325	56,098,927
Russia	7,875,944	6,408,535	8,193,132	11,403,810	14,210,953	15,942,057	22,316,679

* Including Newfoundland.

Australian and Chinese trade has doubled, Russian and Canadian trade has almost trebled, and that of Japan has quadrupled. Meanwhile, there is an increase of twenty-two millions in the exports to India, and of twenty millions in those to the United States.

The writer proceeds here to hit on the most vulnerable part of British Trade :—"That there are danges ahead for our trade, apart from the rivalry of Continental Europe and of the United States, is only too apparent from a survey of the international field as it is to-day. The East is awakening in a fashion which bodes ill for some of our staple industries. Japan is mobilising her commercial forces as she mobilised her Army and Navy for the fight with Russia, and when she has completed her preparations she will cut with deadly effect into certain sections of our Eastern trade. The competition will be the more serious because China is also organising her resources on Western lines. An alliance between Japan and China for commercial purposes is one of the possibilities of the near future. If such a confederation should be effected, the Yellow Peril would, as far as trade is concerned, become a vivid reality.

Nor is this all that the West has to fear. The industrial awakening of the East has extended to India, where, in the last few years, important steel and iron works have been equipped with native capital and are preparing to contest with Western enterprises for a share of the Eastern trade. It may be that the superior efficiency and skill of European workmen will to some extent neutralise the advantage which these Oriental ventures will possess in the matter of cheap labour. But the struggle cannot fail to be a strenuous one, and to work havoc at the outset with the trading interests of the producing countries of Europe." Would not the opening of the Panama Canal impose another check to British trade in the East ?

The Oil Production of the World.

The oil production of the world in barrels, during 1912, was as follows :—

United States	...	222,113,218
Russia	...	68,019,208
Mexico	...	16,558,215
Dutch East Indies	...	10,845,624
Rumania	...	12,991,913
Galicia	...	8,535,174
India	...	7,116,672
Japan	...	1,671,405
Peru	...	1,751,143
Germany	...	995,764
Canada	...	243,614
Italy	...	86,286
Other	...	250,000
Total	...	351,178,236

Openings for Business.

[For particulars address, the Director-General of Commercial Intelligence, New Imperial Secretariat, 1, Council Street, Calcutta, mentioning the *Wealth of India.* Firms that may like to follow up any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualified to handle.]

LIME JUICE AND CITRATE OF LIME.

A prospective manufacturer of concentrated lime juice and citrate of lime in India is desirous of getting into touch with buyers of these products. (C 161)

SILKS AND EMBROIDERY.

A firm in Cairo is desirous of communicating with manufacturers of Indian silks and articles of embroidery. (C 163)

HORN DRESSING COMBS.

A Sheffield firm is desirous of communicating with importers in Calcutta and Bombay of horn dressing combs. (C 164)

OILSEEDS, HIDES AND SKINS AND GUTS.

A merchant in Trieste, Austria, is desirous of securing agencies for the sale of oilseeds, hides and skins and guts. (C 165)

IRON AND STEEL GOODS.

A London firm is desirous of communicating with importers in Bombay and Calcutta of iron and steel goods (galvanized sheets, black sheets and tinplates). (C 169)

HIDES, SKINS AND WOOL.

A London merchant is desirous of communicating with exporters of raw and tanned hides, goat and sheep skins, horse-hair, cow-hair, goat-hair and wool. (C 170)

SACKS.

A London firm is desirous of communicating with shippers of jute cloth and jute sacks. (C 172)

EBONY AND SANDAL WOOD.

A merchant in Kyoto, Japan, is desirous of communicating with exporters of ebony wood and red sandal wood. (C 173)

MACHINERY.

An official in the United Provinces is desirous of communicating with sellers of machinery for drawing gold and silver wire, for making silver chains and for rolling silver leaf. (C 174)

PIECE-GOODS AND YARNS.

A Commission Agent in Melbourne is desirous to hear from shippers of (*a*) unbleached cotton piece-goods of Indian manufacture; (*b*) cotton yarns for rope-making, and (*c*) jute yarns. (C 175)

TEA REFUSE.

A merchant in Palampur, Kangra Valley, is desirous of communicating with (*a*) exporters of Tea Refuse for the manufacture of Caffeine; and (*b*) sellers of machinery for the manufacture of Caffeine from Tea Refuse. (C 176)

GUNNY CLOTHS AND GUNNY BAGS.

A merchant in Osaka is desirous of communicating with exporters of Gunny Cloths and Gunny Bags in Calcutta. (C 177)

PLAQUES AND TRAYS.

A Liverpool firm desires to communicate with importers of ornamental plaques and trays. The firm also wishes to appoint Agents at the principal ports for the sale of these goods. (C 181)

MACHINERY AND PAINTS.

A Lucknow merchant is desirous of obtaining an agency in the United Provinces of Agra and Oudh for the sale of American goods (oil engines, ice plants, paints and varnishes and files for fitter's use). (C 184)

BEESWAX, TAMARINDS, GRAMS AND MAGNESITE.

A merchant in Hamburg is desirous of communicating with shippers of beeswax, tamarinds, grams and magnesite. (C 185)

CHROME ORE.

A Railway Company in India is desirous of communicating with sellers of chrome ore. (C 186)

BANANA FLOUR.

A merchant in the Central Provinces is desirous of communicating with firms that make plant and appliances for the conduct of the successive processes incidental to the conversion of bananas or plantains into flour. (C 187)

The Economic World.

Gems as an Investment.

While Indians are so mercilessly reviled for their 'barbaric' love of jewels and ornaments, it is a relief to turn to an article written by a 'fair correspondent' of the *Madras Times*, who says that gems as a money investment are of immense importance. Sumptuary laws and caste limitations are factors which no longer have a social significance and the meanest pariah, or an uneducated boor, may wear gems of price if he can afford it, and indeed many such people are able to afford the luxury, if it may be so-called in these days of more evenly distributed wealth. As the standard of comfort rises and commerce and industry expand, and wealth gets to be within the reach of the many, instead of its being, as it was in older days, the privilege and possession of the few, the demand for gems will increase in a manner which the supply will scarcely be able to meet. All the mines of Brazil and the Rand will not be able to supply the demand of the world's requirements in a few years, and then the value of gems will increase proportionately. Even now, according to the writer, the pressure is beginning to be appreciable. A diamond of the purest water set in a gold ring—not that the gold is of much importance—which twenty-five years ago was considered fair value for an equivalent of Rs. 150 cannot now be purchased for less than Rs. 500. Emeralds, and no gem is more rare than a pure emerald, which sold at Rs. 100 a carat a quarter of a century ago, it is impossible to secure now for less than seven or eight times that sum, and as time goes on and wealth grows and accumulates, these gems will increase enormously in value. The writer, it appears, was informed the other day that a single necklace of pearls which some few years ago was purchased for Rs. 800 is now worth Rs. 5,000. People no longer, like Cleopatra, dissolve their pearls in wine; they prefer to preserve them and make them heir-looms or sell them at an enormous profit. Gems with a romance behind, like the 'Kohi-Noor,' are surely a veritable mine of wealth.

Tariff and High Prices.

Writing on Oct. 11, the Berlin correspondent of the *Westminster Gazette*, said that the American tariff reduction was a symptom of a coming general decline of protection. The decision of the United States to cut down their rates was not due so much to any abstract considerations regarding the illogicality of the old system, as to the discovery of the world-rise in prices, which has showed no signs of climbing down. The burden seemed to have been felt to be unbearable, when high world-prices coincided with artificially raised prices in local markets. From this point of view, the Reichstag deputy, Herr Hoff, writes an article to a Berlin paper in which he predicts that Germany will have, as a matter of national necessity, to cut down her duties. There is no prospect, he says, of the present high world-prices declining; on the contrary, they will most probably continue to rise; and that will be a last blow to the high tariff system.

NO QUESTION OF PRICES BEING DRIVEN DOWN.

Herr Hoff agrees in a prediction recently made by the protectionist Professor Sering that there is no question of food prices at any future time being driven down by the opening up of fresh virgin soil. That stage is past. In particular that is true of grain; and under no circumstances can we expect a continual falling-off in grain prices such as was experienced in the middle of the seventies. It is more likely that in the next few years prices will go still higher. All the causes which have led to the recent appreciation will continue to operate not only in Germany but also everywhere else. Food prices will be driven up by the continued increase of the non-agricultural population and by the using up of new land.

The present high German grain tariff might

says Herr Hoff, have been justified had it been imposed in order to counteract the influence on agriculture of falling world-prices ; but the fact that it was put in force at a time of rising prices deprives it of all justification, and turns it into a mere measure for enrichment of the great landed proprietors.

THE "WATER-TIGHT TARIFF QUESTION.".

The great recent rise in world prices and the certainty that the rise will go further deprive, adds Herr Hoff, the agrarians of all reason for their present demand for a "water-tight" tariff ; the natural tendency is in the opposite direction. Once the rise in prices is shown to be continuing, a cutting down of tariffs will be inevitable. "Such a reduction can be carried without any economic upheaval even for the agrarians, and for our people in general, including our small and middle-sized farmers, the reduction will prove a blessing."

Dr. Holles, a South German publicist, also declares that "high prices have dealt a death-blow to high tariffs." "The experience of America," he says "shows that high duties may be borne for a long time with relatively small grumbling." As long as prices in the world market are low, high tariffs act as a not unbearable fine imposed on the consumer in the interest of a minority of producers. When world prices are low, the tariffs may artificially stimulate native production, and there is then general prosperity, so that the high home prices are borne. That is the case with America. Later there comes a period of high world-prices; and on top of these the tariffs become unbearable; for, while it has lost the capacity of giving any fresh stimulus to native production, it is adding heavily to the appreciated world-price. That has also been the condition in America. The American tariff had ceased, even artificially, to foster industry; and had become an unproductive burden which benefited only vested interests. In this way tariffs in every country are threatened by the present high prices.

The Food Price Question.

A correspondent to the *Investors' Chronicle* writes ;—Taking the Board of Trade retail food price index figures and averaging them over three five-year periods, we get this result :—

London Retail Prices.

Standard Index Number, 100 for the year 1900.
Averages for the whole 23 articles covered :—
1898-02, 100·1 ; 1903-07, 104·0 ; 1908-12, 110·1.

Taking the three big B.'s—bread, beef, and bacon—separately, the figures work out like this :—

Bread.—
1898-02, 101·8 ; 1903-07, 107·0 ; 1908-12, 113·0.

Beef.—
1898 02, 101·0 ; 1903-07, 100·9 ; 1908-12, 111·4.

Bacon.—
1898-02, 104·0 ; 1903-07, 113·0 ; 1908-12, 128·2.

Such, briefly, are the facts. What are the reasons ? In the general discussion that has been provoked by the rise in food prices two or three important points in the problem have been overlooked even by the eminent authorities. The root of the matter lies in the circumstance that the world's manufacturing trades are expanding more rapidly than agriculture. Relatively to total population, the food producers are not keeping pace with the food consumers. Another factor in the problem is the growing demand for a higher quality and wider variety of foods. And yet another is the growth of local rates and national taxes.

On the first point a few figures may usefully be quoted. In the United States, between 1900 and 1910, the number of persons engaged in manufactures increased by no less than 30 per cent. Those employed in agriculture only increased by 11 per cent. In the mining, building, and carrying trades also the increase of workers was larger than on the land. In Germany, between the census of 1882 and that of 1907, the agricultural workers increased by 1,600,000, but in four groups of industrial occupations—textiles, metals, mines, and buildings—the aggregate increase was 3,300,000. In the United Kingdom, in two census periods, 20 years, agricultural workers have declined by 250,000, while those in

the four chief non-food producing trades—textiles, metals, mining, and building—have increased by 1,300,000. In most other countries, in France and Austria, in Japan and in Canada, the miners, the manufacturers, and the builders are all increasing in numbers faster than the farmers.

This industrial development has not merely reduced the relative number of the world's food producers, just as it has increased the food consumers; but the higher wages and standards of living adopted in the manufacturing towns and mining villages have combined to enhance the demand for superior classes of food. Some articles are now consumed quite commonly which, only half a generation back, were almost exclusively the luxuries of the rich. The tomato, for instance, is now as common as the apple. Very new potatoes and very early peas are now demanded by the democracy as a matter of course. We don't want beans and cabbage and old potatoes and bacon for dinner, as our fathers did. We call for green peas and cauliflower and new potatoes and lamb. We can't eat turnips. We want French beans and parsnips. Weight for weight, these superior foods take far more labour and expense for their production. Meantime there is less labour—certainly less cheap labour—available for agricultural purposes, relatively to population. Women and children do not work in the fields as they used to.

Now for a few more figures. The phenomenal growth of non-food producing occupations in America, for example, means that that country has a rapidly diminishing surplus of food available for export. In the last fiscal year, ending June, 1912, the United States only exported 30,000,000 bushels of wheat, against 102,000,000 bushels in 1900; only 11,000,000 lbs. of canned beef, against 55,000,000 lbs; and only 209,000,000 lbs. of bacon against 512,000,000 lbs. In all the other food stuffs, the declines in the exports from the United States between 1900 and 1912 ranged from 33 to 75 per cent. Need we wonder at increased prices? From the early part to the very closing years of the nineteenth century not only was there a rapid development of agriculture in North and South America, in Russia and in Australia and New Zealand, which fully off-set the growth of manufacturing industries in this part of the world, but there was a remarkable cheapening as well as an acceleration of ocean transit. From America to England the cost of carrying a sack of wheat fell, I believe, from 5s. down to 9*d*. But now, not only is the growth of manufactures larger than that of agriculture, as just mentioned; but freight rates have lately been moving up. We seem to have reached the limits of cheap transit, both by land and sea. In America the railway rates have had to be put up, because wages and coal prices have risen. On the sea the demand is for stronger vessels, greater safety, and better food and pay and accommodation for the sailors. Steam coal prices have also moved up, and will never move down again to the old levels.

Then there is the factor of taxation. In our own country the twin burdens of local rates and national taxes together have increased by 50 per cent. since 1895, while the population has only increased by 12 per cent. Farmers, merchants, and shopkeepers have to bear their portion in the first instance, and then pass it on to the consumer. We demand new parks and libraries, levy a new rate on the shopkeeper, and pay an extra half-penny for our cheese. If we will have clean streets, pure water, old age pensions and new Dreadnoughts, we must pay for them, just as we must for lamb and green peas if not satisfied with bacon and beans.

The Economic Effects of the Panama Canal.

In a paper read before the Economic Science and Statistic Section of the British Association, Professor Kirkaldy estimated the probable economic effects of the opening of the Panama Canal by noting its local effects and its effects on the world's trade. The Professor said that from the industrial point of view three questions arise: (i) Who shall supply certain markets; (ii) who shall perform the service of transport; (iii) what routes shall the shipping take?

The following are among the principal factors, on the balance of advantages of which, the above questions will be decided: (1) distance; (2) tolls on the route; (3) freights, and the possibility of continuous freight-earning; (4) fuel stations; (5) insurance rates; (6) the political factor; (7) rates of exchange; (8) investments of capital and banking facilities; (9) the human factor—manufacturing and commercial ability, experience of trade and markets, present possession.

A. *Local Effects*—The Canal will add enormously to the commercial facilities between the various regions of the American continent and the adjacent islands, hence important developments may be expected. The West India Islands will enter upon a new period of prosperity, especially when the internal-combustion engine takes the place of steam, and oil replaces coal. English business and fiscal methods will have a great effect on making the West Indies important to shipping, and thus assist the development of local industries, especially the export of raw material. The comparatively unprogressive States of Central and South America will undergo remarkable developments owing to increased immigration of Europeans and increased trade. These local benefits will be the chief, and ample, justification for the construction of the Canal.

B. *The Effect on World Trade*.—(1) America realises the importance of the coal trade to the United Kingdom; there will be a strenuous attempt to displace British coal throughout the world in order to give American shipping the advantages at present enjoyed by British. If successful this will deal a mortal blow at English mercantile marine.

(2) The published scheme of tolls which frees American coasting ships, raises an international question. If the Canal be worked on business principles, higher tolls will be exacted from other shipping; this will either cause a grievance, or decrease the tonnage using the Canal. The question might be made domestic instead of international if America charged equal tolls to all, and gave bounties to such shipping as it wished to favour.

Factors.—(1) *Distance.*—Effects on Australasian and Far Eastern markets will be considerable. The mileage run by a steamer is a serious factor in cost of service. In this, shipping offers a contrast to railways, for when trucks are loaded, length of haul has but little effect on cost of service.

(2) *Tolls.*—Panama differs from Suez here. Suez had an immediate monopoly; with Panama there is in many instances a choice of routes, and high tolls will deflect tonnage.

(3) *Freights.*—To benefit American shipping freight must be available both out and home. To benefit American manufacturers freights must be low.

(4) *Fuel Stations.*—This will be one of the decisive factors, and lead to the keenest commercial rivalry. The American Government are planning to supply good coal at either end of the canal at 19*s.* per ton. The English coal on the Suez route is at present much dearer; to maintain the Suez route in its integrity the supply of cheaper coal is a necessity.

(5) *Insurance Rates.*—These will probably be the same on both routes.

(6) *The Political Factor.*—The working of the Imperial idea in Great Britain, America, and Germany should be noted.

Preferences granted by the Dominions have materially assisted British trade. The possession of the Philippines has displaced Spain from the position of chief trader there in favour of America. The importance of this factor can be traced in the case of Japan, and China, when settled Government comes will be another notable instance.

(7) *Rates of Exchange.*—The Far East has a silver, Europe and America a gold, standard. Rates of exchange affect trading relations. The whole question should be carefully studied. About seven years ago, when a Chinese merchant could get exchange on the West Coast of America at the rate of 119 taels for $100 gold, it paid him to import thence timber and flour; but at present rates, namely, 160 taels for $100 gold, this ceases to be profitable business, and he can trade to greater advan-

tage locally. This factor works independently of trade routes.

(8) *Investments and Banking.*—Great Britain is a great creditor nation. Her advances have been really made in goods, and though the interest has to be paid in gold, it comes in goods covered by bills in terms of sterling, so that investors get their interest in gold. The British, too, have banking establishments all over the world. London is the great settling-place for international trade. All this gives England a very great advantage.

The "Unearned Increment" in Agricultural Land.

The arguments used in support of the principles of re-settlement and against the adoption of the policy of a Permanent Settlement in India have shifted now-a-days from the basis of the assertion of a right based on a *rajabhagan* or State share of the produce of the soil, derived from former rulers and supported by the authority of Manu and Akbar. Questions which used to figure much in former controversies under the category of "a needless sacrifice of revenue," or "the just demands of the State," now find less prominence than those involved in the modern socialistic theories of the "unearned increment" and of the State social ownership of increment values of natural resources. It was because questions of land revenue were presented in this light, that Mr. Ramsay Macdonald, as head of the Socialist section of the House of Commons, expressed the view that the Permanent Settlement is a mistake and should not be repeated. Those reactionary Anglo-Indian publicists who indulge in communistic views as to land ownership in India and employ bureaucratic principles and methods in giving effect to them, have often complacently quoted Mr. Lloyd George's Budget and the taxation of land values as proof of their foresight in introduciug their principles in advance in this country, will, we are afraid, find little comfort in the results which, it now appears, have ensued in the process of working Mr. Lloyd George's principles in respect of agricultural, in contradistinction to urban, land. One particular merit which is claimed for the methods of the Indian land revenue settlements as regards the unearned increments, is that all improvements effected in the holdings by the labour and capital of the ryot are left untaxed and preserved intact for him and that thereby the inducements to effect improvements in the land have not been discouraged. Indian publicists have strenously denied that this claim is justified, though they are willing to concede that honest efforts may have been made to ensure this. They have contended that it is impossible in practice to differentiate and appraise at its proper value the improvements due to the ryot's labour and capital, and those due to the works and facilities provided by the State, still less, from those which are of the nature of merely "unearned increment" or other natural causes. That this contention is sound is now placed beyond doubt by what is happening in England in the attempt to ascertain the mere "increment value" of agricultural land as distinct from what we may call the "improvement value" thereof. The difficulties which arose in connection with this matter led Mr. Lloyd George eventually to withdraw the Revenue Bill of the Session by which he hoped to overcome and remedy the complaints of small property owners and builders against the Budget in 1910. The exact details of the position in this matter are seen from the papers to hand to be those which the representatives of ryots in India and experienced Revenue Officers have often emphasised. The amendment paper to this Revenue Bill showed the determination of the Land Values group to obstruct its passage unless they secured the clause on which they had set their hearts There were 30 pages of amendments, over 60 new amendments having been put down by Radicals. In view of the Chancellor of the Exchequer's reported intention of dropping clause (11) which related to the allowance to be made for improvements, it was feared by them that it would lead to an *impasse* resulting in the abandonment of the Revenue Bill,

which has, in fact, now occurred. The Land Values group attached importance to the clause because it would effect an alteration in the valuation which they considered would give them the unimproved value of agricultural land. This was supposed to mean the "prairie value" of land, after deducting from it all the value created by the skill or capital of man. The Land Song, sometimes sung at Radical meetings, suggested that the land, at its prairie value, was given by the Deity to the people, and the argument was that this prairie value should now be separated and taxed for the benefit of the people. To meet this aspiration, Mr. Lloyd George introduced a provision in the Revenue Bill to deduct from the valuation of agricultural lands the value of the improvements carried out within the last 30 years, a period which was on account of the complaint of small owners sought to be increased to 50 years. But even this, obviously, would not give, as the writer of the "Political Notes" in the *Times* has pointed out, the unimproved value of the land, since 50 years does not take one back to the time of the Ancient Britons. The real reason for taking a short period like this is one from which single taxers shrink. It is that if the valuation were to be taken back far enough, it would be found that the "prairie value" was worth practically nothing at all, and therefore no ambitious scheme of taxation could be based on it. If the capital expenditure on agricultural land for drainage, reclamation, road-making, fencing and ditching, and what not, were taken for the last hundred years, it is doubtful, we are told, whether the rent would pay 1 per cent. on the outlay. And if a longer period were taken, any hypothetical prairie value would dwindle to nothing by comparison. The proposal in Clause 11 of the Revenue Bill, which would only deduct the value of improvements for the last 50 years, would not really be supported by the Land Values group, whose desire would be to get at the bare prairie value, even if that were infinitesimal, this being a matter of principle. The case of building land is generally recognized to be different, since here an unearned increment, it is contended, may sometimes be created by the community. But even as to this, the experience of the last few years has shown, it is stated, to the British Treasury that it is a very disappointing process to collect unearned increment from building land. "It is like gold mining on a quartz reef in which there is not enough gold to pay for crushing. The communal unearned increment, like the gold in the poor mine, is thinly distributed, and the process of getting it has proved to be too costly." Such detailed considerations or elaborate investigations as have been adopted in England to ascertain the bare prairie value of land do not trouble the officers of the Settlement Department in India, though elaborate processes of classification of soils are very often introduced. A general scheme report is sent on which a general percentage increase is sanctioned, which is left to be worked out in detail on each individual holding and the result has been, as must be inevitable, an increase over the estimates and a great inequality in the distribution of the enhanced burden on the individual ryots whose economic condition can by no means admit of sudden and heavy enhancements, even if they be justifiable on the basis of the "rights of the State." Indeed, it would be worth the while of serious students of Indian economics to investigate further, the exact part of the "increment values" of agricultural lands as measured by their outturn, which can justly be said to be "unearned" and therefore form a basis of the enhanced State demand now made.—*Hindu*.

Nationalisation of Railways.

It may be pointed out that India stands ahead of the other countries of the world, in that the virtual ownership of all of her railways vest in the Government of India. But the circumstances that led to this result are, however different from those that are urged by the other nations for a like monopoly of their railways.

The *Manchester Guardian* in a recent number summarises the case for and against the nationalisation of railways. The question is understood to be the principal issue referred

to the Royal Commission recently appointed in England :—

THE CASE FOR IT.

Mr. Gladstone was successful in getting an Act passed in 1844 by a Conservative Government, which has never been repealed, and which gives any Government power to purchase any new railways constructed after the passing of the Act. These powers are not to be exercised until 21 years after January 1st, 1845. The terms of the purchase provided in the Act are 25 times the average profit for the three years preceding, with the proviso that, if such sum appears inadequate in view of the prospects, arbitration shall be held to determine whether any additional sum shall be paid. It will thus be seen that the possibility of the necessity arising for the nationalisation of railways has been in the mind of Parliament from the earliest times of the railways.

The great problem which English Railway Managers in England have to face is the conflict of interest between the different sections of the community who are brought in contact with the railways. Thus, there are the owners, the shareholders to be considered, who quite naturally desire the best possible return for their investments, and who have seen their stock depreciate so enormously lately. Then there is the great number of railway employees somewhere about 620,000 of them, many of whom are inadequately paid and all of whom are feeling the enhanced cost of living. Then there are the traders to be considered, the portion of the community who create the goods traffic which provides such a large proportion of the earnings of the railways, and, finally the general public, affected as passengers and also as customers of the traders. To satisfy all these fully, would appear to be well-nigh impossible. Advocates of State ownership claim that by nationalisation alone can the difficulty be successfully grappled with.

It is claimed that there is a great wastage in the overlapping of 217 railway companies, with their duplication of Boards of Directors, General Managers, and numerous other officials; the unnecessary duplication of railway stations, rolling stock, and many unremunerative and unnecessarily competitive services.

Turning to the passenger department, it is claimed that great economies could be accomplished by the withdrawing of a number of competitive trains between various points, which run only partially filled and not infrequently at unremunerative rates, whilst in other districts an extra service is needed. Many great anomalies in fares occur, again, owing to rival routes, whilst under one administration a more equable scheme of charges could be arranged. Much economy would be possible in rolling stock, especially in goods wagons, undue competition being responsible for much unnecessary haulage of empty stock and also of delays in usage.

Advocates of nationalisation point to other countries which show what State-owned railways can accomplish. Belgium, Germany and Australia may be especially mentioned. In Germany, the various small State lines have been taken over by the Imperial Government with great success, whilst in Australia it became a necessity for development that Government should make and own the railways. In Holland, the State has taken over and is working one of the most important lines and keeping up the traditions of the country for express-train service ; in Japan, too, State ownership became a necessity.

THE CASE AGAINST IT.

Whilst the case for nationalisation is being more seriously considered at the present time, there are many even of the "Progressive" section of the community, who are still keenly opposed to it. In their view, State management would mean less efficiency than private management, and moreover a great increase in "red tape." It is further contended that it is unwise to extend Government patronage by putting a large number of lucrative appointments in the hands of the Government. Then the taking over of such an army of employees by the State would, it is thought, introduce serious dangers in connection with labour disputes as between the Government and such a large body of civil servants.

As to rates, it is stated that equal anomalies occur on the State Continental lines, without elasticity of adjustment, that many of the apparent British rate anomalies are not really anomalies, but occur through getting a large through traffic, by charging what is termed "what the traffic will bear" rates. It is contended that the rolling stock and train services are much superior, taking them all round, in Great Britain than on the State lines and that much greater initiative is afforded to the officials, and especially the engineers, on competitive lines. As regards the poor dividends, or lack of them, on some lines, it is pointed out that the enormous law costs and cost of land, incurred by some of the lines when promoted, has severely handicapped them to the present day, whilst the State lines in other countries were not only not so handicapped, but in some cases were assisted in their projects when first made by private companies.

It is contended, therefore, that the Government of England in taking over the lines would also take over a great amount of watered capital. It is further stated that in Germany the lines became State lines simply for military purposes, and also as part of Bismarck's plan for consolidating the German Empire; but in Switzerland the lines were acquired by the State because previously the lines were owned by foreign shareholders. Again, that in Australia the State had to make the lines because at the commencement of construction, public capital went to the gold diggings; that in Japan the State purchase has been costly and unprofitable. In France, the State line is the worst worked and the most dangerous, whilst the private lines pay. In Canada, whilst the private managed Canadian Pacific line is a wonderful example of progress, the State line is a failure.

Then it is said that if the State took over the railways on the basis of the 1844 Act, the net interest on the purchase, a small amount at best, judging from the present average of railway earnings, would soon be swallowed up by reduction of rates to traders, on the one hand, and advances of wages to employees, on the other. In reply to those who point to the Post Office as an example of State efficiency comes the retort that, "first we have never had an experience of what private management could do for the Post Office, that there is unrest amongst the employees just as on the railways, and that the public never allow the telegraphic department to get on a good paying basis through insisting on reduction in rates." Then regarding the long-term agreements between the various great railway companies, it is said that it shows that economy and concentration can equally well be arranged by private companies, while at the same time safeguarding the interests of the trading and travelling public, and also dealing more generously with the staff.

Punjab Census.

The Punjab Census Report shows a remarkable disproportion between the sexes. The males now out-number the females by nearly $2\frac{1}{2}$ millions in a total population of upwards of 24 millions. This disproportion is due, in part, to famine, but chiefly to plague, which has proved very deadly amongst females, especially those of child-bearing age, and will, no doubt, exhibit its effects for many years to come. The general health of the people appears to be improving, and there are marked decreases in leprosy and insanity, though deaf-mutism shows an increase. Wages have risen, and are estimated to possess double the purchasing power of 20 years ago. The statistics show that there is a high mortality among females between the ages of 5 to 15 and 20 to 40. After 40, the mortality among males is greater.

Low Wages and Infant Mortality.

A correspondent in the *Nation* after a careful comparison of the shaded map of Dr. Newsholm's on "Infant Mortality" and that of Mr. Rowntree's on "Wages" finds that, broadly stated, infant mortality is highest where wages are highest and lowest where wages are lowest. "The two maps are nearly shaded alike. It seems to show that in the large towns and the mining districts of England "conditions" are the governing factor, and cry out for improvement. This is qualified, by remembering that the mortality of infants in towns is largely increased by that stagnant pool of casual labour which breeds pestilence, moral and physical. If wages and housing were better in the country (*where the families are largest*), something should be done to stop the exodus which goes to feed that stagnant pool."

The Financial World.

World's Reserves of Gold.

We take the following from the *Economist* of October 18th:—The veteran M. Paul Leroy Beaulieu, writing in the *Economiste* of last Saturday (11th), discusses the world's reserves of gold in connection with the prevailing dearness of money, a phenomenon which cannot in his view be altogether explained by the results of the Balkan war and the influence of the fear of further complications on the international financial market. In England the Bank rate has risen from 4½ to 5 per cent., and although the rate of the Bank of France stood at 4 per cent. at the end of September, no other bank among all those reviewed in the *Bulletin de Statistique et de Legislation* showed so low a rate, the majority of the houses in Europe asking 5½ (Banks of Italy, Naples and Sicily, Norway, Portugal and Sweden) or 6 per cent. (State Banks of Germany, Austria-Hungary, Roumania, Russia and Finland), whereas at the same time two years ago (September, 1911) the situation was entirely different. Then a 3 per cent. rate prevailed with the Bank of France, Bank of Netherlands, and the Bank of England; the National Banks of Switzerland and Belgium, 3½ per cent.; Bank of Germany and Austria-Hungary, 4 per cent.; National Banks of Denmark, Spain, Norway, Russia, Finland and Sweden, 4½ per cent.; *i.e.*, the monetary position in general was far more encouraging in September, 1911, than it is now. At the same time most of the great issuing houses are in possession of large currency reserves. Taking all the banks included in the *Bulletin's* survey, their coffers contained no less than 29,092 millions of francs, 23,662 millions being in gold; in other words, since the world's output of gold subsequent to the discovery of America is generally put at between 72 and 73 milliards, about a third of all the gold produced is locked up in their coffers. The significant fact is that the sum now held by way of reserve is larger than that held in September, 1911, when the general position, as gauged by the Bank rate, was better. In September, 1911, the banks, etc., held 21,243 million francs' worth of bullion. In two years they have increased their stocks by 2,419 millions, an amount roughly equivalent to the world's output for a year. In spite of this increased hoard the big banks pretend not to have enough money, and have raised their rates to keep what they have got. The greatest holders of bullion are the Treasury and banks of the United States, which held 7,299 million francs' worth of gold at the end of June, 1913. Russia comes next, the State Bank held 3,704 millions in June, 1913—more in each case than at the same date in 1911. France is third. The Banque de France held 3,317 million francs' worth in June, 1913; in June, 1911, 3,212 millions. The Bank of Germany has increased its reserve from 1,005 millions in 1911 to 1,381 in 1913. Argentina holds 1,332 million francs' worth of gold. In fact, M. Leroy Beaulieu states:—"Stress should be laid upon the fact that it is the young countries which are the great hoarders of gold—the United States, Argentina, Russia. They with Canada, Brazil, Egypt, South Africa, and all the other new countries are taking and holding so much that there is little enough left over for the old world." It is, in his opinion, a mistake to attribute monetary stringency to increased output; it is due rather to (1) a series of bad harvests; (2) industrial development and its excessive demands for raw material; (3) universal rise in salaries and reduction of hours; (4) growth in luxury of all kinds At the same time, while relief may be hoped for, as regards the immediate tension, it is unlikely in this view that the very low discount rates of the close of the nineteenth century will be repeated.

The Debenture, its Use and Abuse.

The *Commerce*, in its review of a pamphlet on debentures by Mr. Hebert W. Jordon,

gives us from the latter's pages a popular treatment of the subject. After dwelling on the morals of lending and borrowing it proceeds to say that some financial purists would say that debentures have no use and are, in fact, an abuse. But everyone will doubtless agree with Mr. Herbert Jordan that it is in every way advantageous that companies should be able to borrow on the security of debentures, so long as (to quote Lord Avebury) "the transactions benefit the lender as well as the borrower. Were power to issue debentures withdrawn from companies a blow would be struck at the nation's commerce from which it might never recover, although it would still be possible for them to create legal mortgages on their property. So far as the lender is concerned, the debenture is useful because—

(1) He has a security more easily transferable and marketable than an ordinary mortgage, and one that is obtainable without the observance of legal formalities.

(2) If the debentures are payable to bearer instead of to registered holder, he has a security transferable merely by delivery. Bearer debentures are not, however, for good reasons, in general favour in this country.

(3) He may, if the articles of association so provide, vote at general meetings, and also (in conjunction with the other holders) nominate one or more individuals for the directorate. Thus the holder of a debenture may exercise as much, or perhaps greater, control over the affairs of the company than if he were a shareholder. If "participating debentures" are issued he will be entitled to a share in the profits of the company in addition to interest at a fixed rate.

(4) Should the company fail to pay the interest when due, or the security be in jeopardy, he can either appoint a receiver to take possession (in conjunction with the holders of a specified proportion of the issued debentures) or apply to the Court for an order. Should he have fallen asleep, or not had sufficient leisure to acquaint himself with the facts, his position will be better than if he were an individual mortgagee. He will have many companions in misfortune, and those who are active in asserting their rights will incidentally also look after his interests, for all are on an equal footing. The maxim "There is safety in numbers" may afford him some comfort.

(5) Should he have little capital he can invest it more readily than if a formal mortgage had to be specially drawn up, for in that case the trouble to him and expense to the company would probably be effective deterrents.

These are the chief features of debentures, enumerated by Mr. Jordan, in favour of the lender.

To the company the debenture is of even greater service because—(1) It can raise money by making a public issue much more readily than by creating a mortgage in favour of one or more individuals. (2) It can raise money to a greater extent than if it were an ordinary partnership, for the stock-in-trade and other assets which fluctuate from day to day in the ordinary course of business can be covered by a "floating charge," and the charge may even extend to uncalled capital. It often happens that a firm possessing no property capable of being specifically hypothecated cannot obtain an advance owing to its inability to create such a charge. (3) It can make the debentures repayable at a fixed date (the period being short or remote), or on notice, or redeemable only in the event of a winding up. The last-mentioned are known as perpetual debentures. (4) It can reduce its indebtedness gradually—*e.g.*, by taking power to discharge any debentures on three months' or other short notice, or arranging for periodical drawings, and by purchasing the instruments in the open market.

Moreover, the company has considerable choice as to the nature of the security it offers. The following are a few varieties of debentures forming a series and all ranking "pari passu": —(1) They may contain a floating charge on the entire assets, including uncalled capital. (2) They may specifically charge the company's freehold property and other fixed assets, the remainder being covered by a floating charge,

(3) They may be framed so as not to contain any charge, or only a general one, the series being secured by a deed vesting the assets in trustees for the debenture holders. (4) They may confer no charge, neither need they be secured by a trust deed, provided persons can be induced to take them up.

The author concludes his treatise with a few "wrinkles" which are worth remembering:—See that the company is expressly empowered by its memorandum of association to borrow, or, if not, that such power is implied. If the memorandum is silent the power will not be implied unless it is properly incident to the course and conduct of the business. Consequently a building society cannot borrow without express authority, but generally any trading company may do so. See that the sum to be raised does not exceed the amount authorised by the articles of association. Directors are, for example, frequently prohibited from borrowing any sum beyond the amount of the subscribed capital without the consent of the company in general meeting. If uncalled capital is charged, see that the power taken is sufficiently wide to include it. A power to charge the "undertaking and property, present and future," is not, for example, wide enough, although the more comprehensive term "assets" has been held to include uncalled capital. Ascertain also whether the company has passed a special resolution determining that its uncalled capital shall not be called up except in the event of the company being wound up, as in that case it can only be used for the purpose of the liquidation. Should the company be limited by guarantee, the amount guaranteed by members cannot be subjected to a charge. If it is desired that the debentures shall be a first charge on the whole of the assets, see that the creation of any mortgage or charge on the freehold or other property ranking in priority to or "pari passu" with the debentures is prohibited. It is advisable to have a trust deed in such a case, as if the prohibition appears only in the conditions endorsed on the debentures the holders are not absolutely protected. See that the debentures are expressed to form a series ranking "pari passu" in point of charge; otherwise the instruments may rank according to the dates of issue. See that power is conferred on the holders of the series to appoint a receiver of the property subject to the charge upon the principal moneys becoming payable. In the absence of such power it may be necessary for application to be made to the Court for an order. Make sure that registration has been duly effected, and see that a copy of the registrar's certificate is endorsed on each debenture. If you already hold debentures and the company is unable to pay the entire amount of interest due, don't allow your claim to be postponed to that of others who may be more pressing. It has quite recently been held that in the event of foreclosure the receiver must not pay the arrears of interest to those who have exercised consideration towards the company and thus put them on the same footing as the others, as they are only entitled to be treated as secured creditors for the amount of the principal and interest and to payment "pro rata." In case of doubt, inspect the file of the company yourself, or instruct some expert to do so on your behalf, and ascertain if any prior incumbrances are registered, and the financial position of the company generally. To neglect this precaution on account of the trifling expense involved is a "penny wise and pound foolish" policy.

How to Finance Feeder Railways.

The second landmark in the Railway development of India has been reached by the gradual opening of feeder lines to the main ones which connect the more important towns. The question of finances was the chief obstacle to the early opening up of minor centres by railway communication, but how Madras has successfully met this difficulty was explained by the Hon'ble Sir Harold Stuart in a speech delivered on the occasion of the cutting of the first sod of the Podanur-Pollachi Railway. This example is worthy to be followed in other places. He said:—

You are no doubt aware, that in many fields of public activity, the Presidency of Madras

has shown the way to other Provinces of India. That is essentially the case in this matter of District Board Railways. So long ago as 1878, Mr. H. S. Thomas, who was then Collector of Tanjore, proposed that District Boards should raise money for the construction of feeder lines. In Tanjore the land cess was levied only at the rate of 9 pies in the rupee of the land assessment, instead of at the usual rate of one anna, and Mr. Thomas's proposal was to impose the additional three pies and to earmark the proceeds for railway construction. His proposal was accepted, but one difficulty after another arose to prevent the necessary capital being raised. In 1890, however, a suggestion made by the Government of Madras found favour with the Government of India and the Secretary of State. This suggestion was that the Madras Government, out of its Provincial revenues, and the Local Board out of its accumulated cess, should contribute in equal shares towards the capital necessary to build the railway, and four years later the Mayavaram-Mutupet line was opened to traffic. As the line proved a success, the Tanjore Board desired to build extensions, and in 1899 it offered to buy out the Madras Government, so that it might have the whole line to offer as security for more funds which were to be raised by loan. This was agreed to, and tenders for a Rs. 20 lakhs loan at 4 per cent. for building the extension to Arantangi were received in January, 1901. The result was disappointing. The total amount actually realised was only Rs. 5,87,000, the average price being just over Rs. 95 per cent. The balance of capital required was over Rs. 14 lakhs, and the Government had to come to the assistance of the Board and allow the payment of the Government share in the capital of the Mayavaram-Mutupet line to be postponed. This sum was eventually treated as a loan to the Board, to be re-paid with interest in thirty instalments.

I have described the financial history of the Tanjore District Board lines in some detail, for it has been the difficulty of raising the capital, which has been the chief hindrance to progress in this form of railway enterprise throughout the Presidency. It took the District Board of Tanjore eleven years to make a beginning owing to these financial obstacles.

The success of the Tanjore Line stimulated other District Boards to similar enterprise; but in other districts there was no margin of unlevied land cess to be imposed and, therefore, as you know, an Act was passed in 1900 to allow a District Board to levy a special railway cess of 3 pies in the rupee. Your Board, as Mr. Hemingway has told us, has been levying this cess since 1903. Ten other Boards also imposed the cess, but the only one that has as yet got a railway is the Kistna District Board. That Board succeeded in obtaining a loan from the Government for the construction of the Bezwada-Masulipatam line, and if it had been possible to treat other Boards in the same way, a number of them would no doubt have had railways open before this. It was found necessary, however, to include all loans of this character within what is known as the programme of railway expenditure, and unfortunately the other demands on the programme funds were so strong that no money was forthcoming for financing District Board lines. The position then last year was that, if we include Tanjore, eleven District Boards had imposed the railway cess, but only two of them—Tanjore and Kistna—had succeeded in getting a railway. There was a good deal of soreness and disappointment among the royts who had paid the cess about the long delay in giving them any return for their sacrifices. I do not say that the delay was entirely due to the difficulty of finding money; there were also other causes of delay, and if they had been removed earlier the problem of financing the lines would no doubt have received earlier attention. But at the time of which I am speaking these other difficulties had been overcome or nearly overcome, and it was the question of finance which was then blocking the way.

In the course of a tour which I made in the Southern districts, I inquired regarding the possibility of raising the money locally. The

response was not encouraging. I remember one gentleman who was urging upon me the importance of beginning construction quickly, suggesting, in reply to my inquiry, that funds should be obtained from the London money market. Now I doubt whether District Boards would be allowed to go to the London money market, and for several reasons, I think, it is inexpedient that they should do so. In the first place, they would certainly have to pay 5 per cent. and a substantial commission for underwriting; in the second place, it is desirable that these railways should, if possible, be built with money raised in India. Lastly, the delay in the issue of each loan would be considerable. The last district which I visited in the course of my tour was Coimbatore, and, stimulated by Mr. Hemingway's keen interest in this railway, and by the pressure he applied to me, I had a lucky inspiration. It was to consult Mr. Hunter, the Secretary and Treasurer of the Bank of Madras, and undoubtedly the leading authority on financial matters in Southern India. After some correspondence and personal discussion, we reached the conclusion which has rendered it possible to start the construction of this line to-day. The Tanjore District Board's 4 per cent. loan had been a failure, and Mr. Hunter advised us to avoid all risk of a similar failure, since another such fiasco wound injure the credit of the District Boards and probably necessitate the giving of a higher rate of interest than that which, if offered at once, would attract investors. It is true that the Presidency Corporations and certain bodies like the Port Trusts of the chief ports were able to raise money at about 4 per cent. District Board debentures, however, would be a new form of security, and something more than 4 per cent. was required to make them attractive. The Bank of Madras undertook to underwrite the loans if the rate of interest were fixed at 4½ per cent. and that, as you know, is the rate which has been accepted by your District Board The rate which the Board will pay, however, will be rather less than this since the issue price is to be Rs. 103. This gives a rate of interest of 4·37 per cent. and having regard to all the circumstances, I think the District Boards may congratulate themselves on not having to pay more. At that rate the money is assured for all the feeder lines which have been approved. The Bank of Madras charges no commission for underwriting: and it will undertake the whole business of issuing the debentures and the payment of interest thereon, in return for the expenses actually incurred on additional clerical establishment.

There is one other matter of importance in connection with the financing of these projects. The rules made under the Local Authorities Loan Act require that every loan made to a local authority must be repaid within a fixed period. That obligation provides a necessary safeguard of the interests of future taxpayers in the case of works for water-supply, drainage, and the like which have a limited life and produce no revenue. But a railway is a productive work, and since renewals are met from revenue, its life is not limited. It is, therefore, no more necessary to repay a railway loan within a fixed period than it is necessary to provide for the amortisation of the State loan raised for the construction of productive irrigation works and railways. It would, indeed, be unfair to the taxpayer of the present generation to impose burdens on him in order that posterity may enjoy a valuable property free of all encumbrances. Moreover, that method of finance would obviously delay progress, since the railway cess would be required in whole or part for the repayment of railway loans instead of being available for the financing of other railways. We placed these considerations before the Government of India, and that Government, on the 30th October last, notified the necessary amendment of the rules under the Local Authorities Loan Act. These District Board Railway debentures, therefore, will be repayable only at the option of the District Board.

From the date of the taking of a debenture loan until the opening of a railway, the District Board will have to pay interest on the loan

out of its cess or its accumulations, and until the net earnings of the line amount to $4\frac{1}{2}$ per cent. on that portion of the capital which is raised by loan the District Board will have to make up the deficit. It is anticipated that the feeder lines which have been approved will pay $4\frac{1}{2}$ per cent. on the whole capital cost either from the date of opening or very shortly afterwards. It must be remembered, however, that all District Boards have considerable accumulations of cess which will be used to meet part of the capital expenditure. The net earnings, therefore, which will be required to pay $4\frac{1}{2}$ per cent. on the debenture loans will be a good deal less than is needed to give a total dividend of $4\frac{1}{2}$ per cent. the difference varying with the proportion of capital contributed by the District Board. The Tanjore and Kistna District Board lines last year paid a dividend on the whole capital of over 8 per cent. and, I believe, that from the beginning all the District Board Lines which are in contemplation will earn enough to pay the whole of the interest on the debentures, while at no distant date the District Boards will be receiving a very handsome dividend on the amount of capital they have contributed.

I do not think it is necessary to dwell upon the importance and usefulness of these feeder lines. They will give quicker and cheaper transit and transport than the roads. Their construction will also relieve the traffic on the roads and so reduce the cost of maintenance. Except where you have tolls, a road contributes nothing to the interest on its capital cost nor to the cost of its maintenance. A railway meets both of these charges and will usually give a profit in addition. Moreover, the cost of the maintenance of roads falls exclusively on the agriculturist. In the case of the railways it falls on the persons who use them, and in proportion to the extent of their use of them. District Boards have already shown, by imposing the railway cess, that they fully appreciate the many advantages of railways. There are at least 400 miles of District Board feeder lines which could be profitably constructed at once, and long before that programme is exhausted it will have received additions. The accumulations of cess amount to nearly Rs. 1 crore, or about half the capital cost of the railways which are ready for construction. If we had been compelled to wait until the accumulations of the cess reached the amount of the capital cost the date of commencement would still be far off. But under the arrangements which we have now inaugurated, progress will be rapid and steady. For this happy consummation we owe much to Mr. Hunter and we all regret that he was unable to be present here to-day. I congratulate the Coimbatore District Board upon being the pioneer in the new method of financing these feeder lines. It owes that position to its President, Mr. Hemingway, whose interest in all that benefits the people of the district is equalled only by his energy and enthusiasm in pushing every project which is to their advantage. The Coimbatore example has already been followed by Tinnevelly, and we shall soon have so many lines waiting to be built that there is some risk of the resources of the South Indian Railway being unable to meet the calls upon them. The officers of that Company, however, appreciate the advantages of feeder lines, and you may rely on Mr. Muirhead and his subordinates to push them on as rapidly as possible.

National Financial Fallacies.

The Investment Critic of the *Financial Review of Reviews* contributes an article on the above subject to a recent number of that journal.

He says that in the science of finance, the people of the United Kingdom are still strangely behind the times. To Austrian financiers, the world is undoubtedly indebted for the most important reform as yet made in English financial methods. Early in the last century, redeemable loans, divided into series and bonds, began to make their appearance on the Continent, being issued by Governmental authorities.

Most loans raised in Continental Europe have sinking funds attached to them, providing for their extinction at some distant date

This is certainly sounder finance than the creation of a liability that can never be ended except with the consent of those who lent the money.

. As terminable debenture loans, repayable over long terms of years, are but little understood outside financial circles, two short tabulations are given below. Assuming a loan of £10,000 the first table excludes the interest while the second one includes the interest. Thus taking the 50-year loan at 2½ per cent. the annual charge is £102·58. Adding the interest (annual) on the capital £10,000, *viz.*, £250 we have 250 + 102·58 = 352·58, the figure given in the second table. Thus the first table gives the amount that should be accumulated each year at the given rate per cent. to produce the capital, *i.e.*, the annual amount which should be set apart and improved or the annual portion to the sinking fund, while the amount in the second table represents not only the contribution to the sinking fund but also the interest on the capital borrowed.

TABLE I.

AMOUNT OF SINKING FUND REQUIRED TO DISCHARGE A LOAN OF £10,000.

Duration of Loan— Years.	2½ per cent. £	3 per cent. £	3½ per cent. £	4 per cent. £	4½ per cent. £	5 per cent. £
50	102·58	88 66	76·34	65·50	56 02	47·77
55	86·54	73·49	62·13	52·31	43·88	36·67
60	73 53	61·33	50·89	42·02	34·54	28·28
65	62 85	51·46	41·88	33·90	27·30	21·89
70	53·97	43 37	34·61	27·45	21·65	16·99
75	46·54	36·68	28·69	22·29	17·21	13 22
80	40·26	31·12	23·85	18·14	13·71	10·30
85	34·93	26·47	19·87	14·79	10·93	8·03
90	30·38	22·36	16·58	12·08	8·73	6·27
95	26·48	19·26	13·85	9·87	6·98	4·90
100	23·12	16·47	11·59	8·08	5·58	3·83

TABLE II.

ANNUAL CHARGE PER £10,000, INCLUDING INTEREST.

Duration of Loan— Years.	2½ per cent. £	3 per cent. £	3½ per cent. £	4 per cent. £	4½ per cent. £	5 per cent £
50	352 58	388·66	426·34	465·50	506·02	547·77
55	336·54	373·49	412·13	452·31	493·88	536·67
60	323·53	361·33	400·89	442 02	484·54	528·28
65	312·85	351·46	391·88	433·90	477·30	521·89
70	303·97	343·37	384·61	427·45	471·65	516·99
75	296·54	336·68	378·69	422·29	467·21	513·22
80	290·26	331·12	373·85	418·14	463·71	510·30
85	284.93	326·47	369·87	414·79	460·93	508·03
90	280·38	322·36	366 58	412·08	458·73	506·27
95	276·48	319·26	363·85	409·87	456·98	504·90
100	273·12	316·47	361·59	408·08	455·58	503·83

Surely a Corporation or Company, or any other public borrower, which can see its way to bind itself and its successors to pay £40,000 or £30,000 for ever would not incur much extra risk were it to engage to pay a slightly larger annual sum for a stated number of years, say, during the lifetime of two or three generations.

If it be worth while paying £2,100,000 for the use of a million pounds sterling for seventy years, surely it ought to be a wiser policy to pay about three hundred thousand pounds more by insignificant instalments in order to secure release from further payments at the end of such period, or £165,000 more than the bare cost of interest to gain the like convenience thirty years later. And in the case of a 5 per cent. loan the extra sum to be found would be only £118,930 or £38,300, as the case might be.

Owing to the English insular conservatism and want of intelligence on the part of actuaries, this system of redeeming debt has hitherto been almost exclusively adopted by loan-mongers and financiers. Its one prominent rival in the world of finance has been to redeem an equal portion of the debt each year, the

annual charge being thus regularly reduced by the amount of interest saved by each repayment. But a far better way to attain the object in view is so to arrange the *plan d'amortissement* as to extend for a few years the duration of the loan.

A terminable Debenture debt, or terminable annuities, can easily be redeemed with a smaller aggregate outlay than would be entailed by the payment of simple interest for the same term, provided the duration of the loan is fairly long. It is undeniable, of course, that the "sweet simplicity" of Three and Four per cents. is very dear to the soul of the average well-to-do investor, and this fact makes a perpetual interest loan a particularly easy expedient for raising funds, but from the standpoint of the borrower, the transaction is a suicidal one and may properly be described as "mad finance." All classes and conditions of financiers have resorted at times to meretricious issues, and the penalty is now being paid by the living generation, and will be felt still more severely as time goes on. It is wrong to imagine that the construction of these and other plans of redemption call for the possession and exercise of mathematical attainments of a fairly high order. With a little practice, the work can be executed very expeditiously.

The Unity of Finance.

Mr. J. C. Smith has a short article on the above subject in a recent issue of the *African Times and Orient Review.* The close business relations now existing between the great commercial nations of the West and the East, in these days of easy and rapid international communication, have unified, says the writer, all the nations of the earth, on the financial side of trade and industry, by means of the general acceptance of the legal enactments of these great nations establishing gold as the one and only international unlimited legal tender money material.

These enactments, which began in the United Kingdom, in 1816, were continued by the other progressive nations of the West and the East after 1870-1, until, for all practical business purposes, they have established gold as the only ultimate legal basis of the world's existing credit system.

"The world no longer, consists of a number of separate national financial units which can each pursue a separate path in trade" or policy. These matters as they affect Japan, India and China, act and react, "for weal or woe, upon Europe and America, and *vice versa*, as the years pass by, this tendency must become more defined," and more clearly and distinctly manifest even to the man in the street."

This world-wide financial unity should find outward and visible expression within each empire or nation, in the uniform weight and fineness of the gold coins used for internal, wholesale and external business purposes, of the silver and bronze coins used for internal retail business purposes; and between the several empires and nations, this unity should manifest itself as the constant and enduring parity of exchange of the several imperial and national gold, silver, and bronze coins, as the sign and symbol of the equivalence of the metallic contents of the coins of the several empires and nations of the West and the East—as this unity is now made manifest in the nations forming the Latin Monetary Union.

Within and throughout the whole length and breadth of the British Empire sterling money —gold, silver, and bronze coins—should be the one and only unlimited and limited legal tender money.

The cumulative influences proceeding from the coinage expression of the monetary and financial unity of the United Kingdom together with all the British dominions and territories beyond the seas would operate for the strengthening of the economic basis and the monetary ties of imperialism.

Every one of the diverse kinds of special coins now issued by any of the constituent members of the British Empire should be withdrawn from circulation and demonetised (sterling money being promptly and freely issued in exchange therefor) as insidious and invidious elements of economic disintegration, reacting adversely upon the influences which engender the economic and political integration of the developing United Empire.

By these means the several nations of the West and the East would absorb and retain the supplies of silver and bronze coins needed for internal retail business purposes, leaving the world's supply of gold and gold coins, available for internal wholesale and external business purposes within and between the several empires and nations.

Gold is the money of the bankers and the ultimate legal basis of the world's credit system.

Silver and bronze are the money of the people and the actual media of exchange for ultimate consumption purposes.

The Educational World.

Indian Youths and Technical Education.

Pandit Gokaran Nath Misra in moving a resolution on technical education at the last Fyzabad Conference said that industrial development is impossible unless the youth of the country avail themselves of the facilities that exist for technical education and unless they resort to industrial occupations. It was necessary that they should not go in for service or for those professions which are already overcrowded, but should take to industrial pursuits. In the present age, it goes without saying that the real welfare of our country lies in the improvement of its industries. The wealth of the land is slowly being drained to foreign countries and the indigenous trades and industries are slowly dying away. The once famous muslin of Dacca and the silk of Murshidabad no more occupy the extensive field in the Indian market as they once did. What does that imply ? It shows, said Mr Misra, that the attention of our people is no more directed to industrial pursuits, and unless that is done, our industries cannot be revived and our land cannot be saved from the perpetual drain from which it is at present suffering. We should now educate our boys on a more extensive scale for industrial pursuits. It is only in that way that we shall be able to add to the national wealth.

Agricultural Education in Burma.

We learn from the recent report issued by the Department of Agriculture, Burma, for the year ending 30th June 1913, that the only agricultural education undertaken by the Department during the year under review was the training of District Agriculturists. Lectures were given at Mandalay in Agriculture, Chemistry, Botany, Entomology, Fruit Culture and Co-operation, and the students were also employed in practical work Some outside students and certain of the Mandalay farm staff were also permitted to attend the lectures. The Department states that the question of agricultural education is an important one, but lack of funds has hitherto prevented the erection of the Agricultural College and that want will probably continue.

At the present time it is the educational requirements of the working cultivators holding from 10 to 50 acres of land which have the first claim upon the attention of the Department. Recognising this, the Department wish to introduce agricultural education in the primary schools of the Province. The Department proposes to make a commencement by inducing the adult population, most of whom are already engaged in agriculture, to spend a few months in one of the experimental farms. The Department trust that the movement of school gardens which are universally recognised as one of the most useful and practical methods of giving the children of a country bent towards agricultural pursuits, and which have already taken root in some parts of Burma will spread rapidly.

Rural Education.

"Back to the land" is the cry in England now and English Journals teem with articles on rural economy and rural education. In the course of an article written to the *Agricultural Economist and Horticultural Review*, a writer signing himself, 'B,' writes :—

The elementary principles of land cultivation, horticulture, and bee-keeping should supplement instruction in the three R's ; and with broad-minded intelligent training in such matters, many of the crudities in our farm and cottage life of to-day would disappear, and a new sense of duties in our rural homesteads would be generated. Take, for example, such everyday occupations as the keeping of fences, the extinction of weeds, the provision of a constant supply of vegetables for culinary purposes, and a thousand-and-one other matters, coupled with rural life, and we find great laxity displayed almost universally by typical householders. Here we can, however, content

ourselves that future generations will aspire to higher things, simply because our rural primary schools of to-day are supplying, or ought to supply, if they conform to the requirements of the various educational codes, a training in the formation of habits of neatness, forethought, and precision which totally eclipse the slipshod habits tolerated in the past. Nature study, where it is supplemented by well-balanced instruction of the essential kind, is bound to cultivate keen observation powers in the minds of children; and this subject, when helped out by the "experimental plot" gardening object lessons, must eventually introduce new ideas of an orthodox character which commend themselves to the susceptible mind of the rustic. In the past he experimented blindly or followed in his father's footsteps as far as his household duties were concerned. Nowadays, where forceful, methodical instruction bearing on points vitally important to the general welfare of a district is brought to the doors of the cottage and farmhouse, their inhabitants are bound to benefit. Waste ground or products, neglect of seasonable opportunities, inattention to sanitation and general neatness will no longer continue to detract from the well-being of the country at large. The landscape will put on a neater aspect, and a watchful frugality will permeate the home life.

The trend of educational activity in England points to the universal adoption of a system of "education befitted to rural life and adopted to rural needs."

The Lighting of Schools.

A Conference of Educationists was held recently in England in connection with the National Gas Congress when the various aspects of scientific and unscientific illumination in schools was discussed. The difficulty in the way of the teacher in deciding whether or not the prescribed candle-power is given in any part of the schoolroom is fully appreciated, and quite recently an instrument has been put upon the market which enables a test to be made in a simple way. This test consists merely of focussing, in a piece apparatus similar to an ordinary camera, the desk, blackboard, or other portion of the schoolroom which it is desired to ascertain has the necessary illumination, and focus having been obtained, a number in foot-candles is immediately read off on a scale. Opinion was expressed at the conference that all schools should be provided with one of these instruments. Practically no attention was given to the question of the daylight illumination of schools, beyond the expression of opinion by Sir George Kekewich that the frames of windows should be taken right to the ceilings, as this not only gives a better lighting effect, but incidentally considerably improves the ventilation when the windows are down.

Another matter which came in for a good deal of comment at the conference was that home-work on the part of school children should be abolished. The reason given for this was that, having laid down a standard of lighting for schools, and the children's eyesight having become accustomed to that degree of illumination, harmful results would follow in the majority of cases by giving them home-work, inasmuch as the lighting of the average house is considerably worse than the standard laid down for the schools. Sir George Kekewich expressed the opinion that very close needle-work should not be done in the elementary schools, as there was little use in teaching the average child to make such things as lace, etc. Bearing on this aspect of the question may also be mentioned the expression of opinion that the use of art paper, *i.e.*, paper with shiny surfaces, often used in school books, should be avoided, owing to the disturbing effects of the reflections from it.

Technical Education for the English Nation.

England is undertaking legislation on a vast scale, which is hoped to bring about a far-reaching reformation of her system of National Education. In fact, education for the nation is going to be vocationalised and a new type of technical schools will supplant the old grammar schools; and the statement is made that the Junior Technical Schools, where what

is called "wood-work" is taught, but really only the use of simple tools for making, joints or dovetailing two pieces of wood together, will be connected with a net-work of technical schools where every possibility will be provided for the "culture of man's allotment."

"The aim should be," remarks Mr. James Baker, F.R.G.S., writing in the *Journal of Education* "that every boy and girl be educated in his or her future walk in life in such a way that the clever, keen pupil could advance to the highest grade of the chosen trade or profession, or branch off into other callings, fitted for the task by the solid all-round training received in the schools. And this training must be applied to the humblest of callings as well as to the most highly skilled trades. Not only in cities and in small country towns, but in the villages, must this type of education be adopted, so that both lad and lass go out into the world with an interested knowledge of the life work before them; a knowledge that will give a zest to the humblest calling, and develop possibilities of advancement and amelioration in the poorest home; a betterment of the conditions of living; a resort to cleanliness from filthiness, to tidiness from squalor, to mended clothes from rags; to a saner, happier outlook upon life, that shall lead to a rejuvenated people, more inventive, more artistic, more musical; judges of all the good things in life that cost so little or nothing, and for which the hours of labour to-day give so much time for enjoyment—the intellectual pleasure in country scenes obtainable now to all by cheap means of locomotion, an educated pleasure in museums, picture galleries, reading; music, instumental and vocal; and, above all, an interest in the life's work, because that work is scientifically understood.

This type of education has the power also of resuscitating lost artistic industries, creating home industries in rural localities, and discovering the value of local products, or increasing the output of the soil by variation of treatment or the introduction of new methods or the adoption of hitherto unutilized crops."

Mr. Baker instances what this type of education has effected in the outlook, manners and life of people in neighbouring lands—in the town of Znaim in Moravia, the smaller towns of Austria, etc.

"The outcome of this system of education is the development of all trades upon scientific, interesting lines; the recovery of lost arts, the making of life fuller of interest to the craftsman, artisan, and agriculturist; and the repayment comes both intellectually and commercially. The workmen live more interested lives, their artistic products secure a wider and safer market, and the land is made to yield its true increase."

Hand tools.

We extract the following from the *Indian Textile Journal* for July :—

The organisers of trade schools would do well to collect some of the hand tools of the Chinese and Japanese, who are far more fertile in such devices than the Indians. These tools are largely home-made, and are the more valuable for this reason. One need only examine the cabinet work and toys that come from China and Japan, to be impressed with the excellent condition of the tools, that need no assistance from sandpaper. The ignorance of the Indian workman in regard to what might be called basic knowledge, and the shortness of the period that he is able to pass at school, would seem to point to a special kind of instruction in which reading and writing have no part. Four times out of five he forgets all the reading he learned in the primary school, and has little or nothing to show for his training. There are many things of much more importance to the day labourer; the things he will not forget because they are of daily use. Every boy should learn to draw, to sharpen a knife, to distinguish various woods, to knot and splice ropes, to recognise the value of pure water, fresh air, and light in dwellings. He should know that there are only six varieties of snake whose bite is fatal, that the mosquito breeds in water and spreads malaria, that cuts and wounds should be kept clean. He should also be taught how contagious diseases are carried by flies, from

the dejecta of a sick person thrown out of doors, back to the food in the house. Above all, the natural curiosity of the boy should be stimulated to seek for useful information and to think logically about it. This habit, once formed, will endure for life. There is no technical institute for the labourer's son, and the night school does not attract him, it is therefore the more important that all maistries, *i.e.*, leading hands, should be skilled workmen and also teachers, able, in a few well chosen words, to explain a difficulty or a method of work that would save both time and money. Men who cannot read may spend a lifetime within a few inches, so to speak, of knowledge that would throw a new light on their occupation, and considerably increase their wage value. It would therefore be to the advantage of many employers to pay for courses of instruction for selected young men who have shewn ability in their duties, with a view to engaging them as maistries. Chief among their studies would be the art of demonstrating with a few words or a rough chalk sketch the information they would have to impart to their men. There is nothing so good as a strong pocket lens to shew the condition of a blunt edged tool. Very little talk is needed, and if a sharp edge is shewn at the same time, a man will never forget the difference.

Agricultural and Co-operative Education.

Mr. R. D. Udhyavar gives us an idea of the work done in Europe, notably in Germany and Denmark, to encourage the development of agricultural and co-operative education in those countries, in a contribution made to the latest number of the Poona *Agricultural College Magazine.* The subject is cleverly and exhaustively treated, aud it will be convenient to take up Germany first, as that has been first dwelt on by the writer himself, reserving Denmark and the author's conclusions to a subsequent issue of our journal :—

One of the fundamental reasons for the results in co-operation actually attained in Germany is, undoubtedly, says the writer, to be sought in the thorough-going system of agricultural instruction that prevails. From small beginnings one hundred years ago agricultural education has so far extended in Germany that at the present time there is no branch of agricultural production for which special facilities for instruction are not provided. A whole system of secondary and elementary agricultural instruction has been organised.

The instruction in agricultural co-operation is given both at the Universities and at the high schools. A special co operative seminary has been founded at the Universities of Halle and Zurich and lectures on co-operation applied to agriculture regularly given at the Universities of Berlin, Jena and Breslau. Classes in co-operation are held in nine high schools, among others at the commercial high schools at Berlin, Cologne, Frankfurt-on-Main, and Munich. At the agricultural high schools in Berlin, students are given the opportunity of attending classes on the co-operative movement and lectures are given on agricultural co-operation and on co-operative law. A special professor ship of agricultural co-operation has also been endowed at the Technical High School of Danzig. The Education Committee of the Central Union of German distributive societies has arranged for a course of instruction to the members, supervising committees, warehousemen, cashiers, and other officials. Instruction is given in the subjects of book-keeping, law, the care of merchandise, co-operative propaganda, co-operative literature, the historical development of distributive co operation, national and social economy, and banking and insurance. The municipal labour bureau at Berlin intends shortly to start a course of instruction on co-operation. The classes will be held three times a week. On each evening there will be half an hour's practical instruction. Only members of Managing and Executive Committees, registered co-operators and members of societies will be admitted.

At the University of Halle, where a seminary for co-operative instruction has been established for the purpose of giving those intending to start, manage, and work in a Co operative Society, a theoretical and practical knowledge

of the movement, the following subjects are taught :—The economic significance of the co-operative movement, co-operative law, banking and insurance in relation to the co-operative systems, introduction to the study of politics and economics, agricultural co-operation, mercantile book-keeping, artisans' and small traders' co-operation, and the formation of distributive societies.

The high schools provide for teaching co-operation as applied to agriculture as a means of meeting the growing demand for a supply of "Revisors," managers, lecturers, or directors of Commercial and Technical Departments in Central Unions and large local societies, well trained and grounded in a knowledge of co operation. Special courses of instruction are arranged in particular branches of co-operative business and others for the training of persons whose employment brings them into frequent contact with co-operative organisations, such as officers of local government bureaus or the law courts, etc. The following is the general teaching programme :—

(1) History, organisation, general principles of co-operation as applied to agriculture.

(2) Co-operative Law.

(3) Co-operative and commercial management of—

(i) Central credit and agricultural banks.

(ii) Central purchase, supply and sale societies.

(iii) Dairy societies.

(iv) Other forms of society.

(4) 'Revision,' auditing and inspection.

(5) General and specifically co-operative book-keeping.

(6) Knowledge of goods dealt in and commercial usages.

(7) Money and credit.

(8) General law of co-operative organisation—

(i) Civil law.

(ii) Commercial law.

(iii) Various forms of association.

(9) Railway tariffs.

(10) Postal service, telegraphs and telephone.

(11) Organisation and communication with the authorities and public bodies, with which co-operative societies are brought into contact

In addition to the lessons proper there will be supplementary exercises in practical matters, evening discussions, and a practical student course in the best co-operative organisation existing.

Education in Mysore.

The Government of His Highness the Maharaja of Mysore have approved the proposals made in the following resolutions regarding the development of education in the State submitted to them by the Mysore Economic Conference :—

(1) That suitable arrangements be made for the periodical medical inspection of school children generally on the lines indicated in the following recommendations :—

(*a*) All medical officers in charge of hospitals and dispensaries should regard it as their duty to inspect all the pupils in all the schools in their station. It should be the duty of District Medical and Sanitary Officers to inspect pupils in other schools whenever they are on tour.

(*b*) In the case of each pupil in whom some disease or defect is noticed, a complete record of the result of each inspection should be maintained in a register kept for the purpose. This register should be carefully preserved among the school records.

(*c*) A form should be provided in which the defects noticed and the remedial measures suggested should be noted and handed over or forwarded to the parent.

(*d*) Pupils recommended for treatment should receive medical aid and advice free as out-patients in dispensaries.

(*e*) Once in three months, in the months of January, April, July and October, the Medical Officer should pay his visit of inspection to examine pupils admitted since previous inspection.

(*f*) A cursory examination of all pupils should be made at least once in two years.

(2) That a sanitary inspection of the school building also be made at the same

time as the medical inspection of the school children.

(3) That public libraries and free reading rooms be established on the lines indicated in the following recommendations :—

(*a*) That State Libraries be established at Bangalore and Mysore with any of the existing State Libraries as nuclei.

(*b*) That a regular effort be made to provide in both places books fitted for research work and advanced study in all important branches.

(*c*) That persons approved by the Principals of Colleges be admitted to College Libraries as members entitled to study and borrow books on scientific subjects.

(*d*) That in places where schools have libraries, arrangements be made by the Inspector-General of Education to make such libraries available for the local public.

(*e*) That books be lent from public libraries to paying subscribers and to approved non-subscribers.

(*f*) That free reading rooms be attached to public libraries.

(*g*) That an additional budget provision of Rs. 50,000 during the first year and Rs. 25,000 in subsequent years be made by Government for the supply of books and periodicals to public libraries and reading rooms.

(*h*) That grants not exceeding Rs. 100 and not exceeding subscriptions otherwise raised, be made to village libraries and reading rooms.

(*i*) That all public libraries and free reading rooms established by Government be placed under the control of the Inspector-General of Education in Mysore.

(*j*) That grants be given by Government to private libraries and reading rooms which conform to rules to be framed, irrespective of locality, village or town.

(4) That the scheme of compulsory education be brought into force in all district headquarter towns and in one or more large towns selected in each district.

(5) That permission be given to the Education Committee to organise a course of lectures on the lines indicated in the Note appended to the Report of the Education Committee.

Farm Women's Institutes in America.

To the student of rural sociology, there is no more pleasing prospect, either as an added asset to land management or as contributing to the aesthetic enjoyment of field labour than the movement, now making remarkable progress in every part of the world, a movement which has for its object the organization of women in rural districts for the purpose of providing them with specialised training suitable to the conditions of their life and work. The "Institutes" of Canada and the United States may be taken, as reported in the *Journal of the Irish Department of Agriculture* as the prototype of all the others which exist under different names, such as the *Cercles de fermicres* of Belgium and France, the *Landfranenvereine* of Germany, or the "United Irish Women" of Ireland.

The Women's Institutes of America are modelled on those of Farmers' Institutes of America, and form part of the latter. That is to say, the women's branch is founded, as it were, under the patronage and with the support of the latter organisation. The meetings of men and women are usually held at the same time, but in separate halls, and at the women's meetings subjects of particular interest to women are dealt with. The special feature of these organisations is that they work conjointly with those of the men, the ultimate object of both being identical, namely, the betterment of the conditions of rural life.

The Illinois Women's Institutes, for example which were first organised in 1898, follow the, general lines of the men's institutes and are coordinated with the latter. The women undertake the general direction of their own branch, but its business administration is in the hands of the men's institutes which have voluntarily undertaken this work. In Illinois there is a central body known as the "Illinois State Association of Domestic Science," to which are affiliated a number of local county associations

which are entrusted with the actual "demonstration work." The object of the central organisation is to stimulate interest in all that concerns the home, to encourage the formation of similar associations, to co ordinate their labours and to work for the inclusion of domestic science in the national system of education. It is composed of delegates from the various domestic science associations, whether these are dependent or not upon the Farmers' Institutes; each local society is entitled to send two delegates to the meetings of the central body. A president and officers are elected and an annual meeting is held, simultaneously with the meeting of the Illinois Farmers' Institutes.

The object of the local associations is to improve the conditions prevailing in rural homes by the following means :—(1) Preparation of better and more hygienic food, (2) the practice of domestic hygiene, especially from the point of view of the prevention of disease, (3) the construction and arrangement of the house in as comfortable and attractive a manner as possible, (4) the arrangement of the kitchen, its furniture and utensils, (5) the study of the principles of sound domestic science with a view to lightening the labour of housework, and (6) the instruction of young people in the principles of that science. The association is managed by a committee and officers, who prepare the programme to be dealt with in meetings. Members must be over 14 years of age and must pay an annual subscription of 25 cents (equal to 12 annas in Indian money). If the amount realised by these subscriptions be insufficient to carry on the work of the society, an additional supplement may be levied. Members are liable to a fine of 5 cents for non-attendance at meetings.

The benefits derived from the women's institutes have been great. Besides instruction directly given, they have contributed to the formation of libraries, to the organisation of agricultural shows, the improvement of schools and public roads, the foundation and maintenance of hospitals and the stamping out of tuberculosis. The institutes are, in fact, the main arteries through which the stream of agricultural and economic instruction is enabled to reach the utmost recesses of rural America.

Such Farm women's Institutes exist in Canada, Ontario, etc.

Most of the institutes hold meetings every month. Speakers are supplied by the Department of Agriculture for one or two of these, but the institutes are obliged to hold at least four meetings every year at which they supply their own speakers. In this way the Department seeks to bring out and utilise local talent, and their efforts in that direction have been amply rewarded, for many admirable papers and addresses are to be found in the records of the Women's Institutes. Thus the institutes form a healthy antidote to the dullness of rural life. In some institutes it is the practice to have a box or drawer into which members who are too shy to ask aloud for the information they require can drop their written questions. These questions are placed on the agenda for the next session and are dealt with by members competent to do so.

The institutes recognise no distinction of creed or class; they welcome all serious-minded women who are interested in the ideal for which the movement stands. Every woman with something good to say or give to others gets her opportunity in the institute. The women of the institutes are all working-women, who have to face the realities of life day by day and are keenly alive to the necessity for fitting themselves for their task as thoroughly as may be. The keynote of the institutes is therefore thoroughness and efficiency. But these are not cultivated at the expense of other equally important qualities, and there is a strong tincture of very human, homely sentiment in these strenuous people, who are only anxious to do their best "for home and country" without making any undue fuss about it. Mr. Putnam voices the outlook of the institutes when he says, "We are not and have not been concerned that our organisation shall secure publicity by doing that which is sensational and done for the purpose of attracting public attention. We do not aim to do that

which will give the society notoriety, but our desire is to make the life of the lonely and isolated brighter, to spread the gospel of right living, physically and morally, which we are pleased to know exists so largely among Canadians, and to attract and secure the co-operation of the increasing number of those in our towns and villages who are inclined to magnify society life. The Institute deals with the vital things of life and leaves formalities to the care of others. Our desire should be to deal with the every day needs of our people in such a way that the life of each will be made more perfect."

The Canadian Department of Agriculture issue a very practical Handbook containing instructions on the methods of organisation, directions for conducting meetings, definitions of the powers of the various officers and suggestions as to lines of work or topics to be discussed at meetings. This Handbook is widely circulated throughout the province, and, while leaving each institute full liberty of the choice of subjects, it serves to give cohesion and a certain degree of uniformity to the whole movement.

Every year the institutes come together for an Annual Convention, when addresses are delivered and papers read by members and also by outsiders, who are called in because of their special qualifications in some line or other. At last year's Convention, held in Toronto, the following subjects, amongst others, were dealt with :—What one Institute is doing—Electricity on the farm and in the house—Young women and the twentieth century—What can we do for the boys ? My child's future—St. John's Ambulance Association—The school and its relation to the community—Water supply in country and village homes—Our dumb animals—Eyesight and how to care for it—The bed and bedmaking—The value of cheese in diet—The culture of winter and spring flowering bulbs—The baby on the farm—Medical inspection in rural schools—Rural school-houses and their equipment—Hygiene for rural schools.

Turning to the list of speakers "one of them is a graduate in domestic science and domestic art. Her experience in hospital work and familiarity with both country and city conditions and requirements give her a fund of information much appreciated by the Institute members. She has devoted several months to demonstration-lecture courses in sewing and cooking to groups of institutes." Her subjects are—

Domestic art and what it means to women ;
Teaching children to sew ;
Our clothes, their selection and making ;
The profession of home making ;
Demonstrations on bandaging ;
Our homes ; and
The interests of the homestead.

Another of the speakers "has had practical experience in a farm household and is a specialist and M.A. from Toronto University." She deals with quite a different set of subjects—

A square deal for the girl on the farm ;
Money earning and money spending as a factor in character building ;
Helping our boys and girls to find a niche in life ;
The mother : what she owes to herself, the home, and the community ; and
The unseen background of life.

In the current year it is proposed to deal with the following subjects : Household conveniences and labour saving devices—House planning and remodelling—Water-supply, and disposal of waste for town and country houses—St. John's Ambulance work. These and other technical matters are often treated by outsiders and a pleasant feature of the institute work is the readiness with which officials and professional and business men and women—lawyers, doctors, dentists, bankers, merchants, butchers—have come forward to place their expert knowledge at the disposal of the women, by giving addresses and demonstrations.

INSURANCE.

The Sale of Life Insurance Policies.

The *Insurance Observer* states that the sale of life assurance policies is wrong in principle and objectionable in practice.

It is not, however, intended to suggest that a life assurance policy should be made an absolutely non-negotiable document. Such a proposal would not meet with support from any business man or policyholder. Every premium paid increases, or should increase, the value of a life assurance policy, and it should always be available for example, as security for an overdraft at a bank. But there should be only one available purchaser, and that the company itself, and the minimum price to be paid should be strictly fixed by law. Nowadays most companies do actually state plainly what they are prepared to give by way of cash surrender values paid-up policy, or loan, and there is really very little, if anything, to complain of in the liberality of the terms. If necessary, the companies would even make these terms a little more generous. But a special point of importance is that when a policyholder is dealing direct with the company it is by no means necessary for him to lose all interest in the policy, and that it only requires a little careful arrangement to make the bargain with the company a much more satisfactory one than could ever be possible with a private purchaser, or one who bought a policy at auction.

No one will deny that there are dangers and very real ones in gambling in life assurance policies. A man must be callous indeed if he can go about his daily work unaffected by the knowledge that policies on his life are held by persons to whose interest it is that he should die as soon as possible ; the influence exerted by such knowledge must be very injurious.

Insurance as Certificate of Health.

Father Curry, who has been doing notable work in St. James' Parish, New York City, was recently interviewed by a reporter on the subject of eugenics.

"Of course," said Father Curry, "we encourage fitting marriages as much as we can. I favour healthy marriages only, to be sure. Health certificates would be an excellent thing.

"I have noticed that the Italians among us have a tactful way of managing that. The Italian father and mother ask the young man who seeks their daughter if he is insured. If he is not, they urge him to take out insurance before the wedding. and sometimes they insist upon it. They put the argument for it on the usual grounds, the risk of his dying suddenly and leaving his family penniless. But what they are often most concerned about is assurance as to the suitor's good health. They feel satisfied that if he can get insurance there is nothing serious the matter with him.

"Now, that seems to me a happy way of dealing with a delicate problem, to the satisfaction of all hands and the embarrassment of none."—*The Bulletin.*

Why All Should Insure.

As a writer has said: "If *I* were again young, I should *think seriously* about old age, and prepare for it by means of a substantial endowment policy, so that I might be free from care long before I became bald-headed, and unable to enjoy the bad, as well as the good things of this life." Every one should bear in mind the advice of the poet—S. W. Partridge who wrote :—

Stake not all
On one great speculation ; no wise man
Will hazard what he would not dare to lose.
The prudent general, though resolved to win,
Provides for a defeat ; he marches on,
But has a REFUGE *and a sure retreat*
If he should need them.

Life insurance has one primary purpose. That primary purpose is protection. It is because it protects that life insurance is indispensable to modern life. It may or may not be a good investment in particular cases. That is really comparatively an unimportant matter. Its real *raison d'etre* is protection. It seems not improbable that it is because this primary aspect of protection is not brought strongly enough forward that many people fail to realise the necessity of life insurance. It is suggested to them as an investment or as a quasi-investment, and naturally enough, in view of its comparatively small return as such, is rejected. But place before the same man who rejects it as an investment the arguments that life insurance means protection, point out to him why he needs protection, and to what extent, and the labour of the insurance agent will not be in vain.

MACHINERY, SCIENCE AND INVENTION.

How to See Through Opaque Paper.

A very remarkable experiment which any one can repeat with very little trouble has been unearthed by a contributor to *Prometheus*, in an old number of the *Mechanics Magazine* of the year 1829. Take a piece of paper of such thickness that, when it is laid upon a piece of printed matter, the characters just show through, but cannot be read. Placing it over a printed sheet, impart to it a circular motion to and fro, and to your surprise you will find that now you can read the print below the paper. It is rather difficult to explain this peculiar effect. The explanation offered in *Prometheus* is that the paper has a number of thin places in it, and by rapidly moving it over the print, every part of the printed matter is exposed in turn underneath one or the other of the thin places in the paper and thus the entire print can be read. However, that may be, the experiment is interesting and very simple, requiring for its performance only the simplest means imaginable.

Planting Artificial Hair in the Scalp.

Aurel Popovics of Torok-Kanizsa, Austria, has patented, a method of imbedding artificial hair in the scalp. A retaining element is applied to the hair and a minute cavity is pierced in the scalp. The end and the retaining element of the hair are inserted in the cavity below the surface of the skin, so that hairs can be planted in the skin with, the inventor claims, such a degree of perfection as to render the artificial nature of the hair covering thus produced completely unnoticeable.

Making Precious Stones with Waste Gas.

At Bittersfeld, electrolytic hydrogen is also used for the production of artificial gems. At the beginning of the present century, Verneuil, of Paris, succeeded in devising a process of making synthetic rubies, and another Frenchman, Michaud, in the middle of the nineties, succeeded in making what are known as "reconstructed rubies" out of natural ruby fragments. Almost at the same time a German gem polisher named Herman Wild of Idar, began to make real artificial rubies. Later he collaborated with Prof. Miethe. They developed a process which was eventually adopted by the Bittersfeld works. In that process, hydrogen plays an important part. Not only are real rubies thus made, but genuine sapphires, topaz, and other precious and semi-precious stones. These products must not be regarded as mere imitations of real gems, but as genuine precious stones.

Ripening Dates Artificially.

Some parts of the desert in California ar Arizona which are suitable for the cultivatic of the date palm have the one drawback, th the natural heat cannot be depended upon . bring the fruit to perfect ripeness. To elin. nate this uncertainty, Prof. George Freeman of the Agricultural Experiment Station, University of Arizona, has invented a device which will ripen the fruit artificially to perfection. It is exceedingly simple and inexpensive. In fact, it has been used already on a commercial scale, as 100 pounds can be treated at one time in his laboratory. The device consists c a metal oven, in which dates are placed, afte being picked when they just begin to ripen. preliminary washing is needful, after which they are kept in an even temperature of ab 50 deg. Cent. (122 deg. Fahr.) for three and in a moist atmosphere. This renders t as sweet and delicate in flavor as the natu ripened fruit, and far superior as a table cacy to the dried and pressed dates with w we are familiar. The process is also use restore dates which have remained upon tree until withered. The moisture brings t their plumpness and flavor, while their who some qualities are not impaired.

Ripe dates treated in this way are box like choice confectionery. They will sta shipment to all parts of the United States a Europe, as experimental consignments h shown.

HINTS AND RECIPES.

To Fit a Cork.

When a cork is slightly too large for a bottle place it in boiling water for a while to soften. It will then go in easily.

If a Boot or Shoe Pinches.

A cloth wrung out of very hot water and laid over the place while the boot is on the foot will expand the leather and give instant relief.

Woollen Socks.

Wash woollen socks quickly in lukewarm ther, and do not let them lie in the water to ak. If they are very much soiled, a little rax in the water will quickly draw out the rt. Rinse in tepid water

To Remove Typewriting Ink.

To remove typewriting ink from linen, place the inked parts in turpentine and soak twenty-four hours, then pour boiling soda water on it, rinse and dry, and the stains will be completely removed.

Care of Lamps.

A manufacturer of lamps has the following to say in regard to their care:—"The reason lamps smell and give poor light is because they are not kept clean r because the wick is poor or clogged by hav- been used too long, or else the chimney is ong. A lamp should be cleaned, trimmed, l filled daily. Trim by rubbing the char the wick. This leaves it even. Wick ould never be cut, because it is impossible do it evenly. Keep the tiny holes in the or of the burner clear for draught. Lamps ould never be quite full, because the oil xpands with heat, and if there is no escape hen an explosion is liable to take place. Boil the burner in strong soda water once a nonth, and empty the fount whenever any diment appears. Never open a lamp while ot. Some persons even need to be told never to fill a lighted lamp. There is explosive vapour in a hot lamp. Light a lamp with the wick turned low, and raise gradually. When a lamp has stood long enough to become hot it should be moved with very great care."

Sugar for Seasoning Wood.

The *American Sugar Journal* says that a new use has been obtained for sugar. It is, said to be the main ingredient entering into a new process for rapidly maturing or seasoning wood for furniture and cabinet making. Timber steeped in a sugar solution is said to take as many months to mature as it ordinarily would years.

Cleaning Bones and Ivory.

To clean and prepare bones and ivory—(1) The curators of the anatomical museum of the *Jardin des Plantes* have found that the spirits of turpentine is very efficacious in removing the disagreeable odor and fatty emanations of bones or ivory, while it leaves them beautifully bleached. The articles should be exposed in the fluid for 3 or 4 days in the sun, or a little longer if in the shade. They should rest upon strips of zinc, so as to be a fraction of an inch above the bottom of the glass vessel employed. The turpentine acts as an oxidizing agent, and the product of the combustion is an acid liquor, which sinks to the bottom, and strongly attacks the ivory if allowed to touch it. (2) Make a thick paste of common whiting in a saucer. Brush well with a toothbrush into the carved work. Brush well out with plenty of clean water. Dry gently near the fire. Finish with a clean, dry, hard brush, adding one or two drops (not more) of alcohol. (3) Mix about a tablespoonful of oxalic acid in $\frac{1}{2}$ pint of boiling water. Wet the ivory over first with water, then with a toothbrush apply the acid, doing one side at a time, and rinsing, and finally drying it in a cloth before the fire, but not too close.

HEALTH AND HYGIENE.

A Chinaman's Health Programme.

Mr. Wu-Tink-fang framed a practical health programme while Chinese minister to the United States. He mentioned eight things which formed his plan of living; (1) Giving up breakfast, taking only two meals a day—luncheon and dinner; (2) Abstaining from all flesh foods, confining the diet to rice or whole wheat bread, fresh vegetables, nuts and fruits; (3) Avoiding coffee, cocoa, liquors, condiments and all rich foods; (4) Giving up salt; (5) Masticating every mouthful of food thoroughly before it is swallowed; (6) No drink at all with meals, but between meals or one hour after; (7) Practising deep breathing and (8) Moderate exercise.

Asthma and Parrots.

Dr. Arthur Latham, in an article on the treatment of bronchial asthma calls attention to some curious facts bearing on that very common ailment. Stress is laid upon the sensitiveness of the nasal mucous membrane. A man, in otherwise perfect health, consulted Dr. Latham because he had been suffering frequent acute attacks of asthma for three months. On going carefully into the details of his life the fact was elicited that the first attack of asthma coincided with the purchase of a parrot. The patient had been in the habit of keeping this animal in his bedroom, and of fondling it on retiring to bed. On advice he got rid of the parrot. He simultaneously ceased to suffer from asthma. It was believed that some impalpable dust, perhaps minute bits of feather, was due to the presence of the parrot, and had had the effect of starting the nervous reflex. A girl employed in a tea-shop kept well in London, but always had an attack of asthma when she went to her home in the country. Her father was a farmer, and her room overlooked the farmyard. When she avoided the farmyard as much as possible and changed her room, she was able to escape an attack on most occasions when visiting her home. The moral of these and other cases cited is obvious.

Germicidal Tobacco Smoke.

It is not surprising to learn that tobacco smoke is inimical to the activity of micro-organisms, since it contains, among many other things, pyridin, which has been shown to be a powerful germicide. Definite experiments have recently been made which show that tobacco smoke rapidly destroys in particular the common bacillus of cholera. A good many years ago it was reported by the senior medical officer of Greenwhich workhouse that the tobacco-smoking inmates enjoyed comparative immunity from epidemics, and tobacco-smoking was believed to have had a disinfectant action in case of cholera and other infectious diseases. Again, during a cholera epidemic at Hamburg it was reported that not a single workman engaged in the cigar factory in that city was attacked by the disease. Later it was stated that amongst a body of 5,000 cigarmakers only 8 cases and 4 deaths from cholera occurred. Subsequent experiments proved that tobacco smoke destroyed the bacilli of Asiatic cholera as well as pneumonia, and there was some evidence also that tobacco smoke was preventive of some forms of nasal catarrh. It is interesting to note that pyridin is official in the French pharmacopœia, and in France it has been employed in the form of inhalation in asthma, emphysema, and angina pectoris, and mixed with peppermint in diphtheria. Excessive tobacco-smoking, of course, may easily give rise to constitutional effects which diminish the resisting power of the body to disease, in which case it is probable the habit would afford not only no protection but an opening for invasion.

To Cure Hiccoughs.

Fill a glass tumbler with clear, cold water, and place on a table. Then have the patient stand where he or she can look directly into the glass, and fix the attention about the centre of the bottom of the glass for about a minute, when the patient will find the hiccoughs have entirely disappeared. This has been known to cure the most violent cases of this disorder when all other remedies have failed.